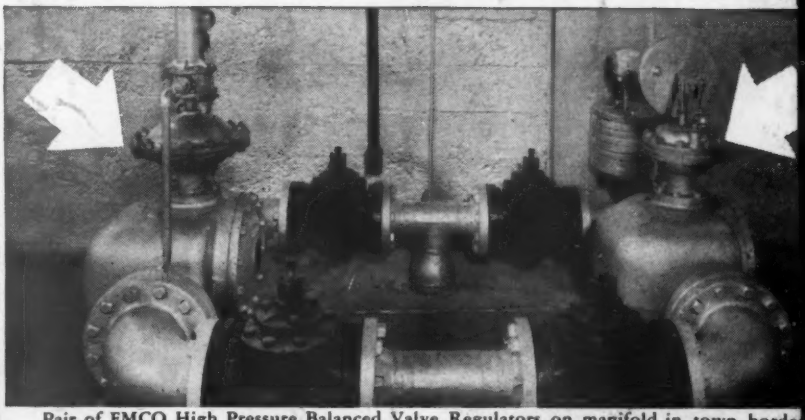
AMERICAN
GAS JOURNAL

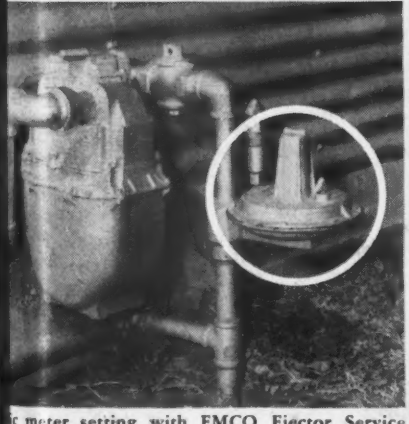
MCO REGULATORS

STOP

PRESSURE
LUCTUATIONS

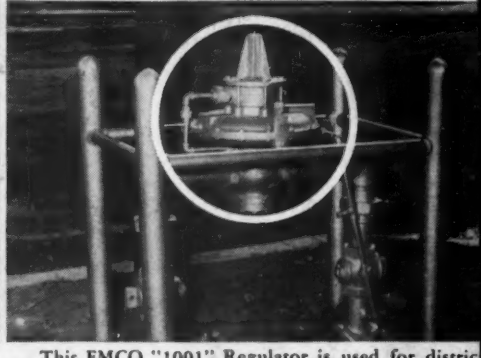


Pair of EMCO High Pressure Balanced Valve Regulators on manifold in town borde station. EMCO pilot loaded control at left; lever and weight control at right.



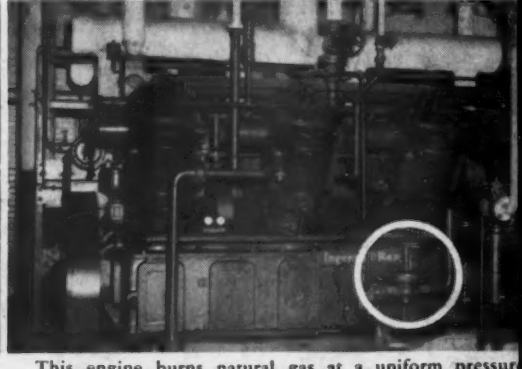
c meter setting with EMCO Ejector Service or controlling house utilization pressure.

EMCO Appliance Regulator holding constant burner pressure on industrial water heater.

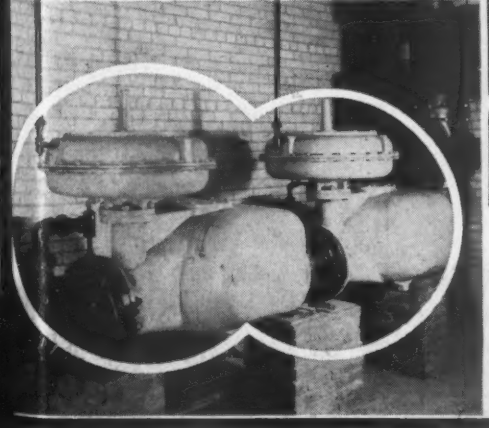


This EMCO "1001" Regulator is used for distric pressure control in a municipal distribution system.

These EMCO Field Regulators cut high transmission line pressures to a constant intermediate distribution range.



This engine burns natural gas at a uniform pressur supplied through a Crawford Regulator.



Manufactured gas served to large housing project is controlled by two 10" EMCO Low Pressure Balanced Valve Regulators.

EMCO *Specialized* EQUIPMENT *for* GAS MEASUREMENT *and* CONTROL

23,000 TEST-YEARS *Prove*

THERE IS ONLY *ONE* PERMAGLAS

THE equivalent of 23,000 years of metallurgical and ceramics research was required to perfect SMITHway *Permaglas* for water heater tanks. Just "any glass lining" won't do! There is no way to by-pass the time, patience, scientific knowledge and facilities required to develop the ceramics formulae and the metallurgical processes that have made *Permaglas* possible.

Resistance to thousands of water specimens, and a multiplicity of other time-consuming tests starting way back in 1929, continued for eleven long years before we were ready to offer *Permaglas* to the public.

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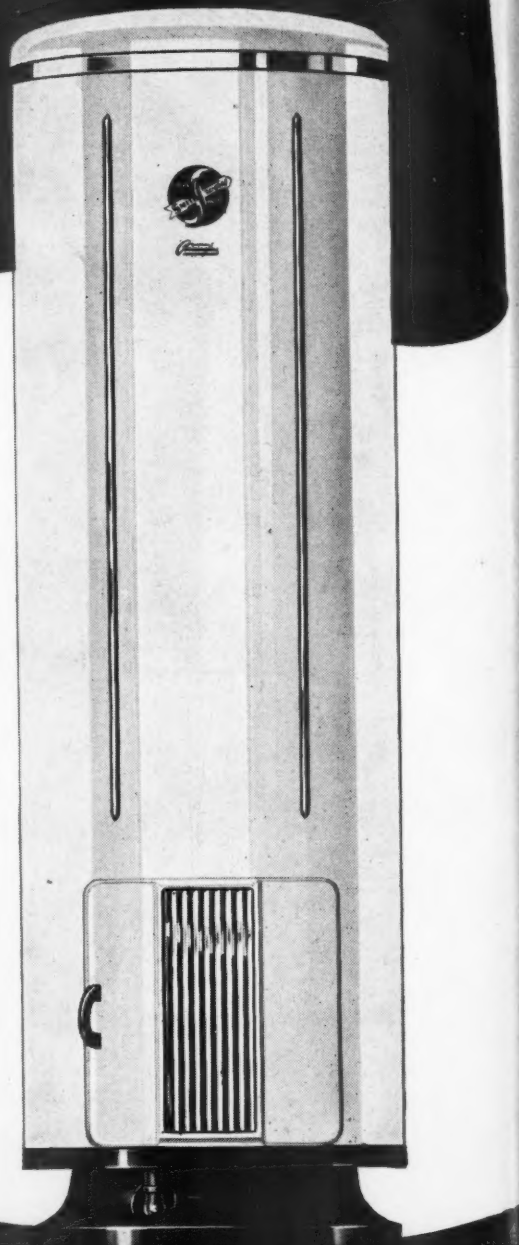
Write for "The Inside Story of *Permaglas*" . . . a great aid to sales.

"Heated with Gas, Stored in Glass"



SMITHway

A. O. Smith Corporation,
Dept. AGJ145 H

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Title.....

Company Name.....

City and State.....

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TRADE MARK REG U S PAT OFF

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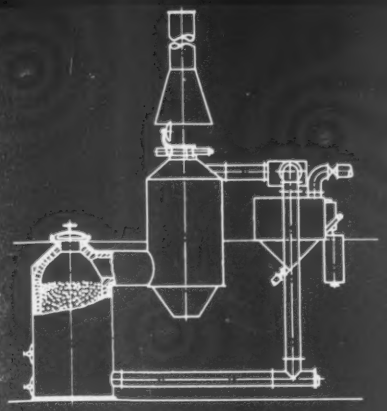
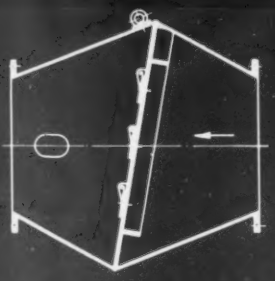
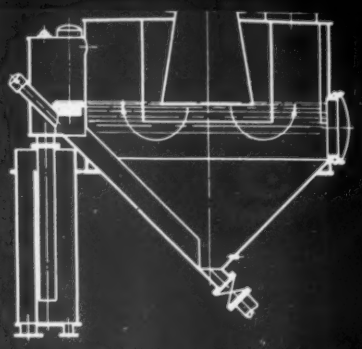
ST



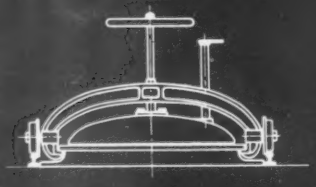
BLUE GAS MACHINE



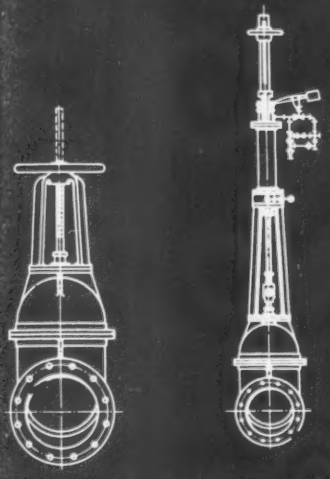
CHECK VALVE



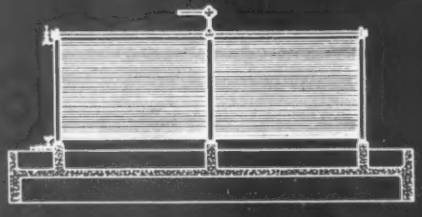
HYDRAULIC SEAL
OR
WASH BOX



CHARGING DOOR

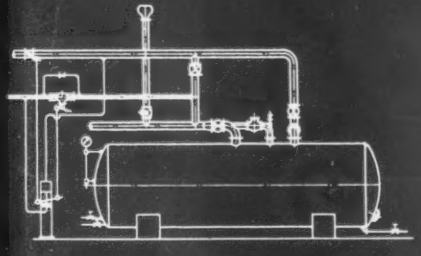


HAND OPER. HYDR. OPER.
GATE VALVES

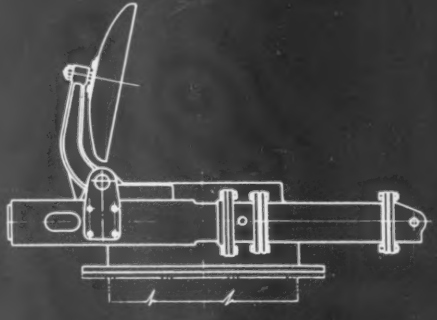


COOLING COIL

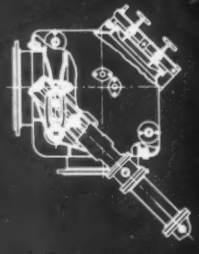
GAS SCRUBBER



STEAM ACCUMULATOR

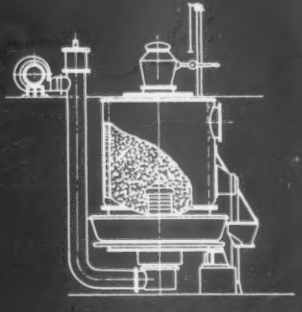


HYDRAULIC OPER.
STACK VALVE

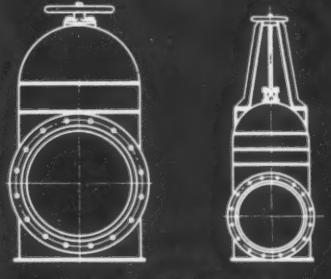


HYDRAULIC OPER.
REVERSING VALVE

STE HEAT BOILER



GAS PRODUCER



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EQUIPMENT

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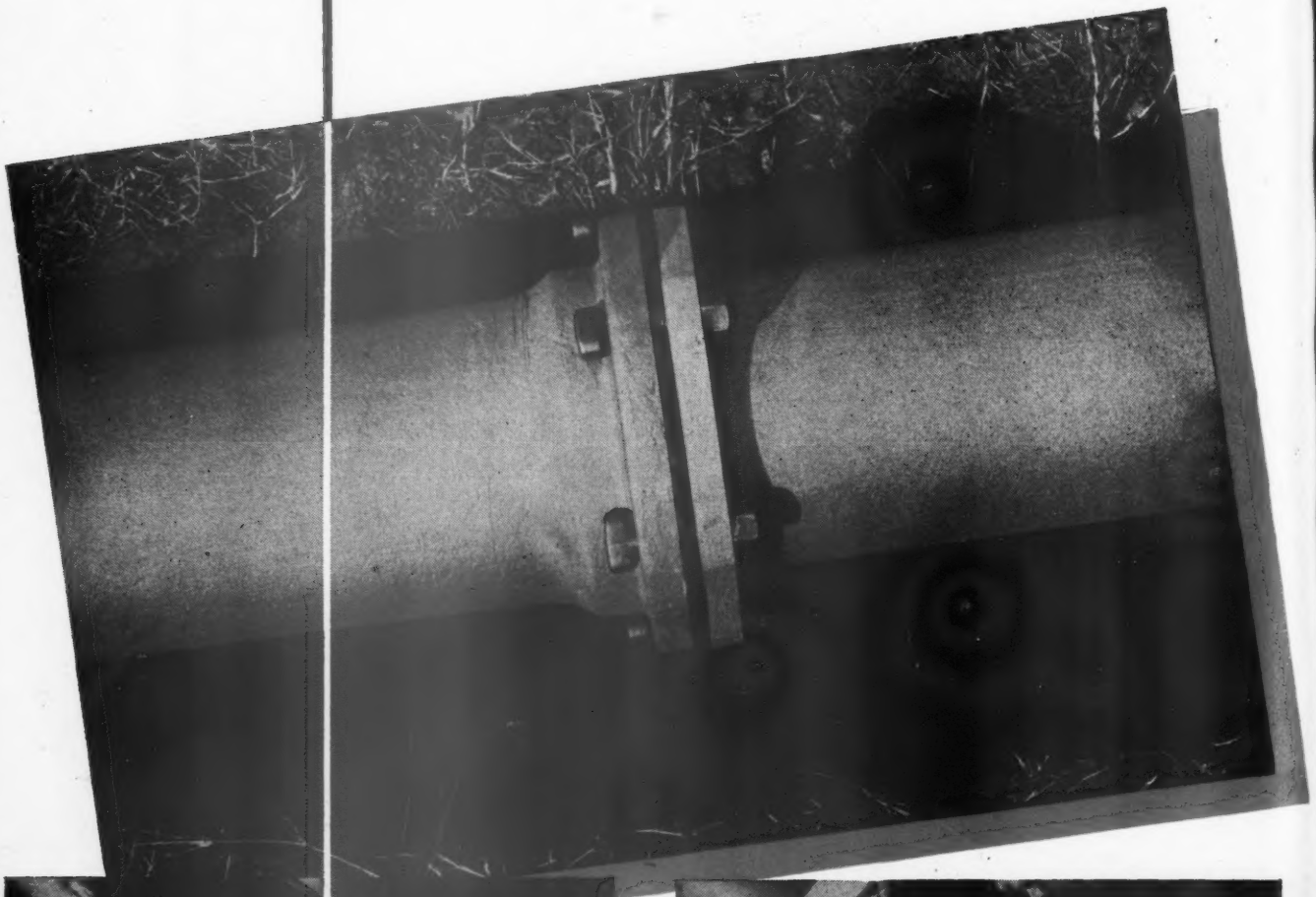
It's here . . .



Paint socket, spigot and gasket with soapy water.

Slip gasket into position, making sure it is evenly seated in the socket.

THE *Standardized* MECHANICAL JOINT

A standardized mechanical joint, incorporating the best features of the bottle-tight mechanical joints hitherto made in various designs by our members, is now available for cast iron pipe in diameters up to 12-inches. Larger sizes will be available later.

Besides the general benefits inherent in standardization, particularly in time of war, this new service offers these specific advantages:

- All parts are interchangeable no matter who supplies the joint.
- No need to stock different kinds of glands, gaskets and bolts.
- No delays on the job through delivery of wrong parts.

Ease, simplicity and speed of installation—always important advantages of mechanical joint cast iron pipe—will be still further enhanced as experience accumulates in working with one standard design.

All members of Cast Iron Pipe Research Association are now prepared to furnish the Standardized Mechanical Joint, with interchangeable parts, in sizes up to 12-inches. Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, Peoples Gas Bldg., Chicago 3, Illinois.

With gland in position, insert bolts and tighten partially with fingers.

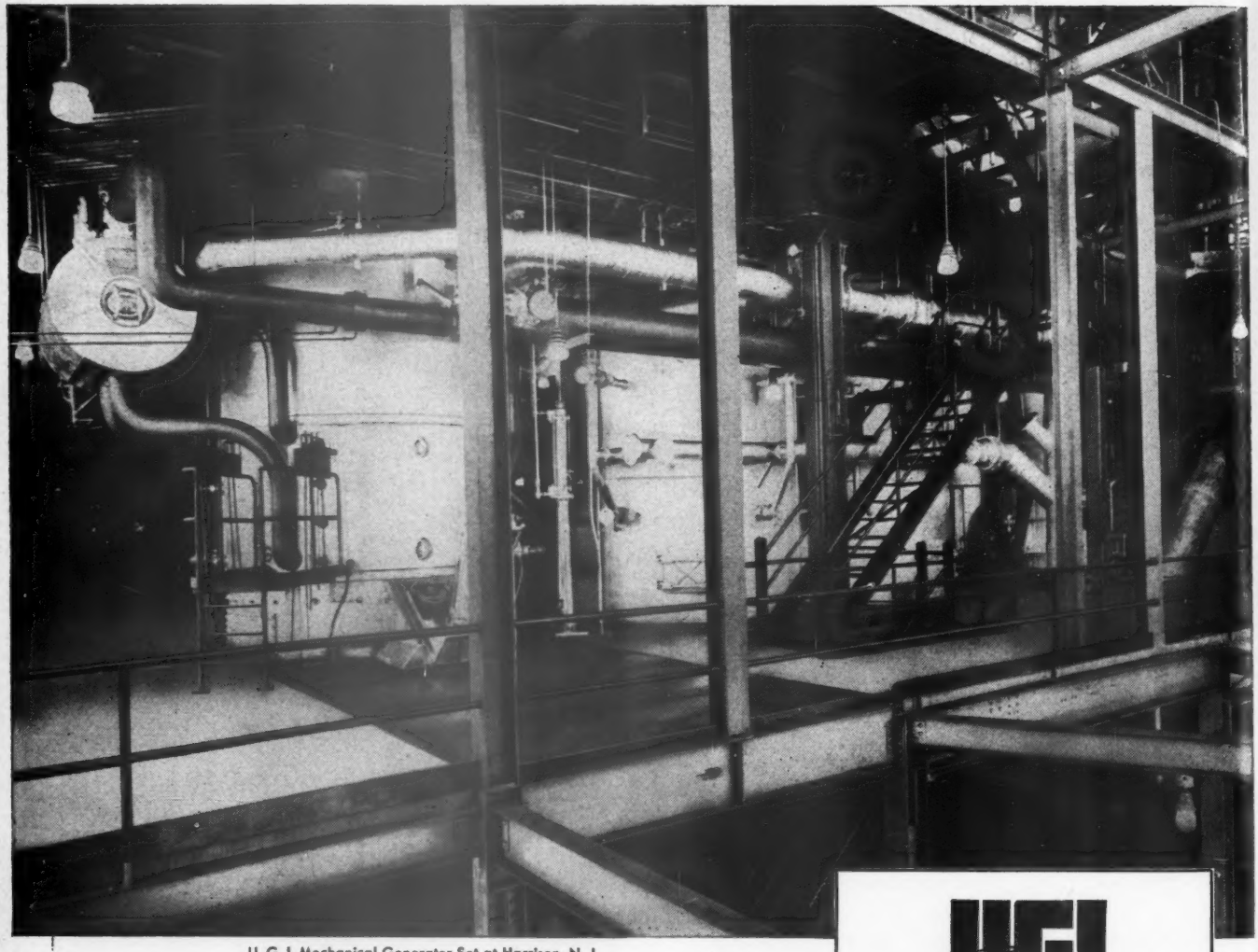
Take ordinary ratchet wrench (only tool needed), tighten up bolts alternately (bottom bolt, then top bolt, and so on). That's all!

CAST IRON

Standardized **MECHANICAL JOINT**

PIPE

USE "UNITED ENGINEERS" FOR PLANT EXPANSION



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UNITED ENGINEERS provides an organization experienced in all of the problems of present day construction to design, construct and place into operation the facilities necessary for gas plant expansion.

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EXPERIENCE IN OPERATION
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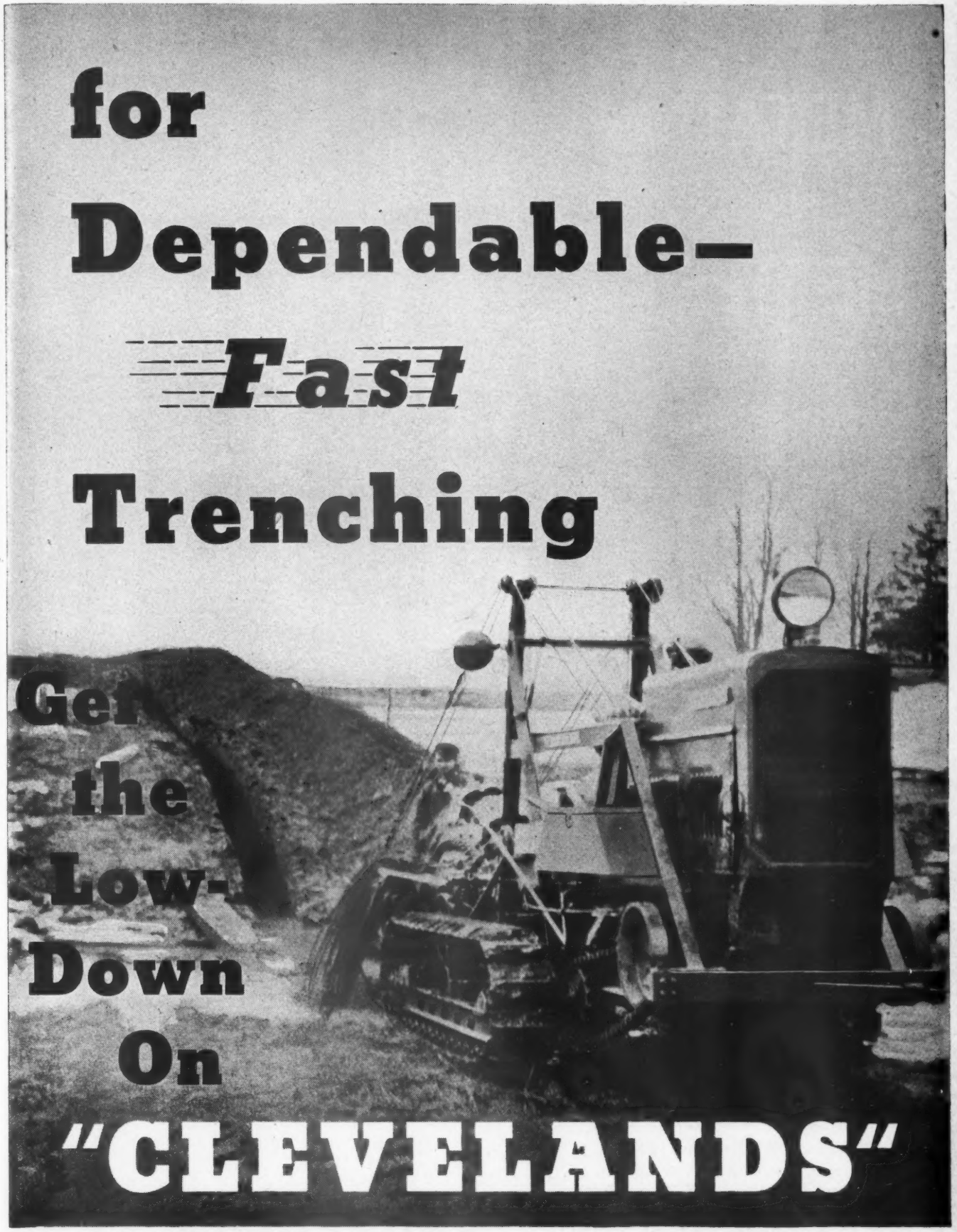

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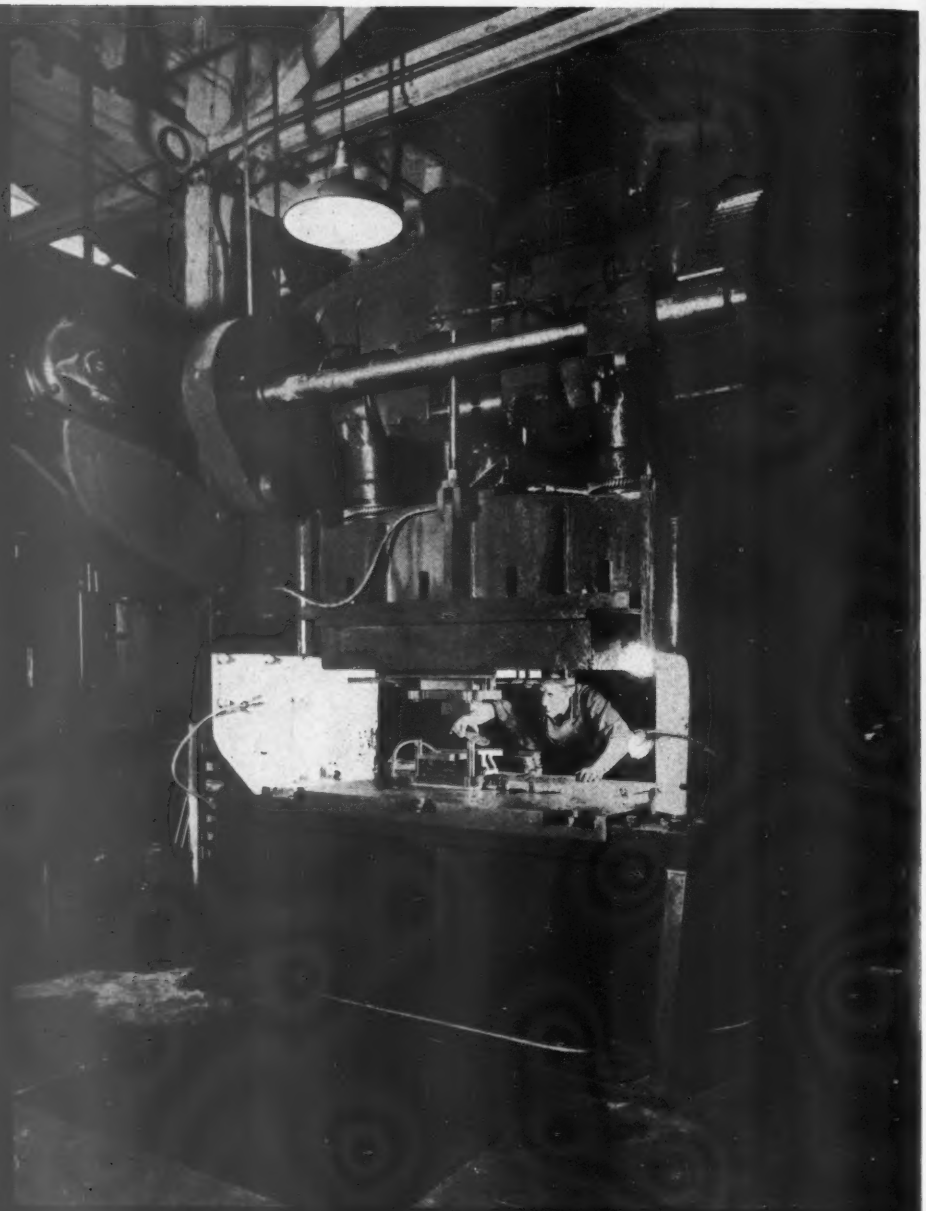
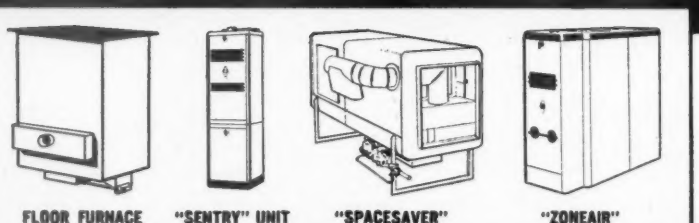
METAL and METTLE

...both tested by war, better prepared for peace



This 150-ton press, Plant No. 1, stamps heating elements for many PAYNE units



Machines and men . . . metal and mettle . . . have teamed-up at the greatly-expanded PAYNE plants to produce for Victory. ★ Final reconversion will find us with new, finer plant equipment and advanced engineering skill . . . better prepared than ever to supply fine furnaces for all America. ★ To dealers and gas companies, this means that *pre-war* progress will be surpassed by *post-war* opportunities. ★ PAYNE "civilian production" is worth waiting for.

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Selling aid for you! Progressive development of the time-tested PAYNE "Unit" System: Winter air conditioning, summer ventilation . . . controlled by zones, rooms or apartments. *Request new booklet.*

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GAS FUEL HAS EVERYTHING

VOLUME 162
NUMBER 6

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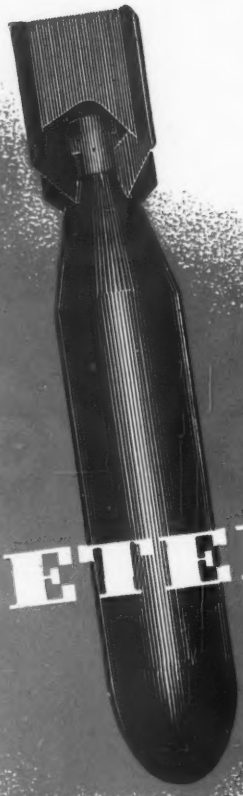

Odd-looking GAS METER?

Yes . . and it's one specific example of the way in which the equipment suppliers for the Gas and Petroleum Industries have put their shoulders to the job of winning the war.

For while we have turned much of our production experience and plant capacity to making war materials, these industries—themselves engaged in "Victory for Freedom"—have cooperated fully by foregoing, in many instances, the purchase of badly needed meters.

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1945

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GAS JOURNAL

VOLUME 162
No. 6

Natural Gas As the Raw Material For New Products

By
E. P. Schoch

WITH eighteen years of intensive study of natural gas and its problems behind me, I am firmly convinced that there can be developed great new industries based upon this natural resource, especially in the State of Texas, whose reserves are greater than any yet uncovered on the face of the earth.

I turned my attention to natural gas when my attention was directed to the appalling waste of this commodity. From a spot on which I was standing, I could see no less than 16 flares in a single oil and gas field in the vicinity of Corpus Christi. This appalling waste affected me greatly, and I felt that something must be done to stop it. I realized that this would not be an easy task, but I determined to do what I could. It appeared to me at the outset that the logical way would be to develop new ways of gas utilization, profitable ways and as near to the source of the fuel as possible. New methods of utilization would necessarily contribute to higher prices, and, after all, the profit motive is the chief inspiration to conservation. I have never had to change my mind.

The author of this article, Dr. E. P. Schoch, was born in Berlin, Germany, October 16, 1871, of American parents. His parents returned to the United States when Dr. Schoch was an infant, settling in San Antonio, Texas. Dr. Schoch was educated in San Antonio and at the University of Chicago. In 1897, he joined the University of Texas, located at Austin, the State Capital, in 1897, as an instructor, and has remained there ever since. He occupies the chair of Chemistry at the University, and is recognized internationally as an outstanding authority on the subject of natural gas.—Ed.

My first activities were concerned chiefly with fundamental research, particularly as it related to the use of the so-called electrical discharge through gases, a method which up to then had not been employed in this particular sphere. Since that time radically new methods of electrical discharge have been developed in the University of Texas' laboratories that have already had far-reaching repercussions and promise even greater developments in the immediate future.

The purpose of this article is not to discuss the past, however, but to treat in a rather general way the possibilities of producing new products from natural gas.

As is generally known, methane is the main ingredient of natural gas. In weight and fuel value it amounts to seven times as much as

Doctor E. P. Schoch
Director of the Bureau of Chemistry,
The University of Texas,
Austin, Texas

the higher hydrocarbons or liquefiable components in natural gas, and our known gas reserves contain an amount of methane equal in weight to our known liquid petroleum reserves.

At present, the condensates abstracted from gas are the only gas ingredients used for making aviation gasoline and chemicals, but they are consumed at a greater rate than the methane. This is because six hundred billion cubic feet of dry gas are now replaced annually in the ground after abstracting fourteen million barrels of condensates from

them. Since these fourteen million barrels of condensates are 30 per cent of the total natural gasoline now produced, and since the "dry" gas is saved for future use, it follows that the methane will last much longer than these valuable condensates. Hence a process of converting methane to higher hydrocarbons will be needed.

Methane is, chemically, very inert or stable. No method is now known by means of which liquid hydrocarbons can be synthesized directly from it. An indirect process for making liquid hydrocarbons from methane was devised by Franz Fischer and H. Tropsch in Germany, and consists of the action of hydrogen on carbon monoxide. In order to use methane for this purpose, it is first decomposed to carbon monoxide and hydrogen by means of either steam or carbon dioxide. But the latter can be made direct from coke and steam, and hence methane is not really needed or used for the process.

The use of methane for the production of wood alcohol and formaldehyde also involves its primary change to carbon monoxide; and the only other chemical products now made—namely, the nitromethanes, and chloroform, carbon tetrachloride, etc.—are all merely substitution products of methane.

The direct coupling of two or more hydrocarbon radicals from methane requires the addition of energy. If this energy is to be added in the form of heat, then the temperature must be very high and the time of exposure very short—a small fraction of a second. This imposes difficulties which do not appear to have been overcome successfully.

In 1929 the writer undertook to use electric discharges through gases for adding the energy required to couple up hydrocarbon radicals from methane. To date this effort has resulted in a process of making acetylene from natural gas. This process is perfectly practicable and economical even though no commercial installation of it has been built so far, due to war conditions which prevented the use of the materials needed for the installations.

Theoretically, it is possible to make many valuable products from methane by means of electric discharges through gases, but it is a question whether they can be made economically. Work is now in progress to determine such possibilities.

It should be pointed out here that it is important to make valuable rather than cheap products—that is, products which add a large manufacturing value per pound of raw material. The importance of a raw material naturally increases as more of the high-valued products are made from it. Thus clays become more important as more and more of the finer products—china ware and art ware—rather than common bricks are made from it. With coal tar, it is the dyes and pharmaceuticals rather than tar-roofing which gives it its importance. Similarly, in dealing with methane, we must seek to make plastics and rubber rather than gasoline—because in making gasoline the value of the natural gas used is likely to be doubled only, but in making plastics or rubber the value of the gas used will be multiplied by forty.

It is with the view of devising profitable processes that this work is being carried on.

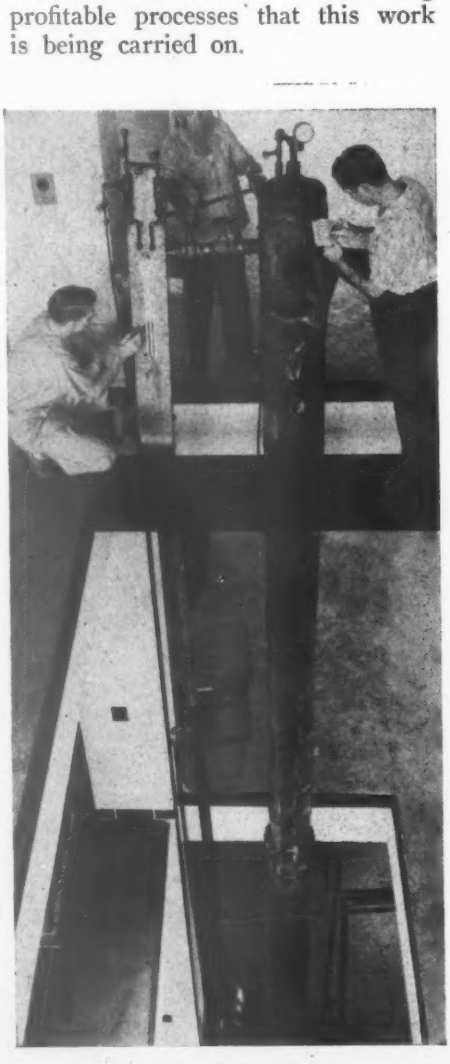


Fig. 1. Column for extracting acetylene from gas coming from the discharge chambers.

Possible Tonnage and Value of Chemical Products

To illustrate the possible tonnage and financial value of such chemical manufacturers, we present the following concerning acetylene. Other products such as ethylene would show similar pictures.

Heretofore, acetylene has been made exclusively from calcium carbide. The latter is made by smelting lime with coke in an electric furnace. Until 1910, acetylene was used solely as a fuel gas. By 1920, it was used extensively for making acetic acid: its annual production in the United States rose from 5000 tons in 1914 to 11,000 tons in 1922, and then to 183,250 tons in 1943. Its present production in Europe is probably more than three times as great. While an essential fraction of this acetylene is used for welding, yet the greater amount is used for making plastics, rubber, and chemicals. In 1942, the amounts of acetylene used for the respective products have been estimated to be as follows:

Acetylene Used	Tons
For Acetic acid	66,000
For Vinyl chloride and Vinyl polymers	4,000
For Neoprene rubber	30,000
For Chlorinated solvents	22,500
For Welding	61,250
Total	183,750

The production of "carbide" is now taxing the established plants to the utmost, and at the end of the war there will be a large increase in demand for acetylene.

The average weight of the products made from acetylene is about twice as much as that of the acetylene itself; and the average price of the product (plastic) is about 40 cts. per pound. Hence, a production of 100,000 tons of acetylene from natural gas in Texas would produce products worth eighty million dollars, and this would be made from about twenty billion cubic feet of gas which is used partly as raw material, and partly as fuel. This gas—at 10 cents per 1000 cu. ft.—would bring two million dollars to the gas well owners, and produce a forty-fold increase in value due to manufacturing. This is a conservative estimate of what may be obtained.

Possibilities of the Electric Discharge Process

It is risky to dwell on the possibilities of this electric discharge

process. However, without some definite forecast of possibilities the impression may be gained that the writer is dubious about its possibilities:—and this is certainly *not* the case. Hence, the following remarks are ventured.

When, in 1937, the writer first asked the Legislature for funds—to support this work—he suggested that a sum of $50,000.00 per annum be granted—but only one-fourth of this was obtained. At that time—when asked about the possibilities of this work—he predicted that we might obtain a process for making acetylene, and use this for making rubber, and that, within five years, we could be the greatest rubber manufacturing state in the Union. He was then *smiled* at for this prediction—still it happened to come true—but unfortunately we did not have this process developed far enough at the time of "Pearl Harbor" to have it included in the rubber program. To show how near we were, it should be said that Governor Stephenson gave us $35,000.00 to hurry our investigation, and the University Regents furnished another $40,000.00—and with these sums we were able to show by February 1, 1943, that our process could make acetylene from methane and convert this to butadiene and sell this at 9½ cts. per pound. The prevailing cost of this made by other processes and from other sources has been near 20 cts. a pound. Since war conditions made it impossible to obtain priorities to build a plant—it will not be till after the war that our acetylene process can be used. Had we been given the money asked for in 1937, we could have been in production before "Pearl Harbor."

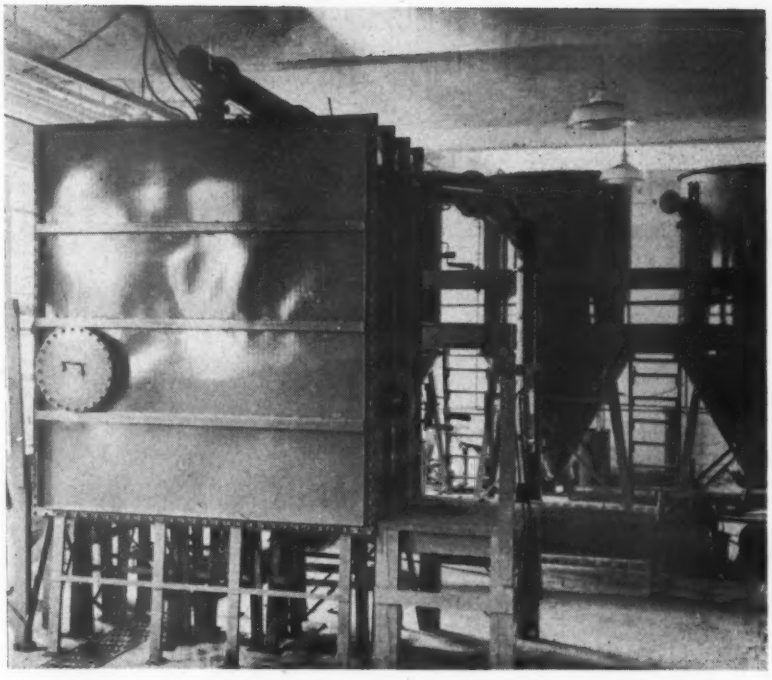
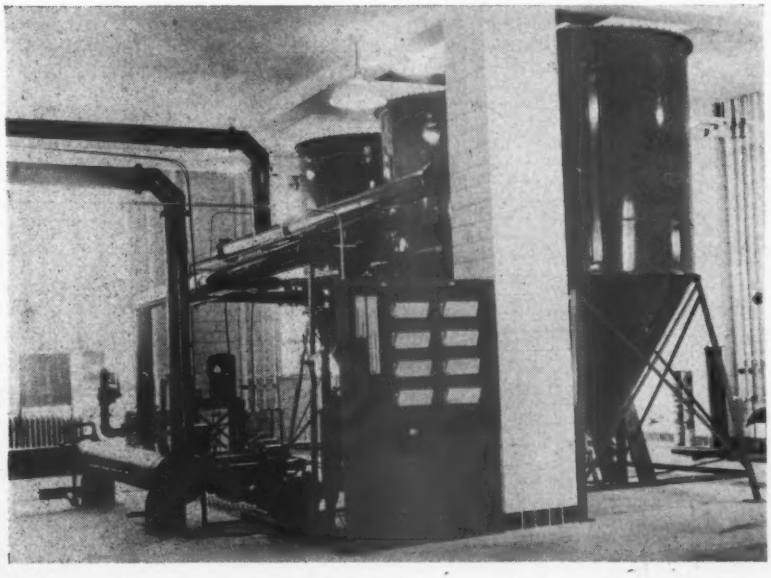


Fig. 2. Electric discharge chamber for methane to acetylene process.

As far as acetylene is concerned, our job is nearly done. But we have other jobs to do. Many other products—*ethylene, higher olefines, diolefines, aldehydes, ketones,* and *acids* are needed and should be made from methane—and we believe the electric discharge can be adapted to produce them.

Acetylene is merely the first product to which the new electric discharge was adapted. This was because acetylene requires the highest energy intensity for its production, and the problem which had to be solved was the "taming" of the electric discharge so that it would not be excessively severe.

Fig. 3. Carbon filters employed to remove by-product carbon in the process of making acetylene from methane by the Schoch electric discharge method.



With further progress of our knowledge of this operation, we expect to "tame" the discharge very much more—and thus may be able to make a whole host of products which require *mild* "activation." Our whole concept of shape, size, and operation of the discharge has made great progress during the last two years, and the picture of possibilities has progressed correspondingly. When, in May, 1943, Dr. A. M. McAfee, Chief Chemist of the Gulf Refining Company, told Governor Stephenson, in the presence of the University Board of Regents and others—that, in his opinion, this process would become as important to the oil and gas industry during the next decade as the oil cracking process was during the last decade—it may have been considered by some that he was taking a big chance, but the progress of this work is now such as to support his prediction more and more firmly.

But this work is expensive:—it cannot be done on a small scale because high voltage and gas both require large dimensions. Just as in heat-cracking operations—so with electric discharge—the experimental work must be made in substantial size to give financially reliable results.

The importance of this work is indicated by the fact that a number

of industrials—oil and gas companies as well as acetylene manufacturers—have contributed sums aggregating $180,000.00 to continue this research. These gifts are made without any conditions attached: they are outright, unconditional gifts.

The effort to use natural gas itself for a raw material for manufacturing had its origin in the realization on one hand that Texas has relatively few other raw materials available, and on the other, that gas has real potentialities as a raw material.

The work done at the University of Texas in this connection consists in passing electric discharges through natural gas to make new compounds. The first product made successfully by these means is acetylene; but further developments of this process are in progress and indicate the possibility of making many other compounds. However, the process of making acetylene alone will return enough to the state to repay all past and future costs. The University owns the patent rights, and will grant non-exclusive licenses to all parties on the same basis. Only one license has been granted so far—and since this licensee has been unable to get adequate priorities for making installations, it is unlikely that other licenses will be granted until the priority situation is changed.

Gas is today in a situation similar to that of oil in 1931. It is sold at the wells at prices ranging from 1 ct. to 5 cts. per M.c.f. At this low price, it is being used for purposes for which lignite could be used and it is being exported in gradually greater amounts. Furthermore, large gas supplies which do not reach public pipe lines are used in a manner which secures a still smaller return than the gas reaching pipe lines. As a result of these conditions, the total amount of gas now withdrawn annually from the ground has increased to nearly two trillion cubic feet, and unchecked, it may rise to three trillion in ten to fifteen years. Estimates of our known gas reserves range from fifty to seventy trillion cubic feet, and the probable discoverable amounts may double this estimate, but this is strictly the State's maximum expectation.

Portland Gas & Coke Co. Has New Procedure to Analyze Customer Good Will

By

Fred A. Herr

A CHANGE in the utility company's policy of measuring customer reaction to service performance and procedure has been carried out by the Portland Gas & Coke Co. of Portland, Ore., with results that have warranted continuance of the new plan as part of the firm's established practice in 1945.

Until the end of 1943 the practice of Portland Gas & Coke Co.'s customer department control bureau was to mail out, or leave at the homes of customers, cards to be filled out by the housewife, the purpose of which was to obtain factual evidence to support opinion on anticipated public reaction to services performed.

In a recent discussion at Los Angeles, Paul Leary of the Portland Gas & Coke Co.'s customer bureau disclosed the firm has discontinued entirely the practice of mailing or leaving cards for residential customers.

Mr. Leary declared that early in 1944 the company initiated a new policy which calls for making telephone calls to new residential customers (residential customers only) to inquire if the service recently performed had been satisfactory.

The employee making the telephone follow-up call was urged to keep the housewife's thoughts on telling "How she liked the service," and if she were completely satisfied with it.

The purpose of the telephone follow-up, according to Mr. Leary, was to let the customer know her patronage is welcome and appreciated and, generally, to create in the customer's mind the thought that her utility company is desirous of keeping relations on a cordial basis. Goodwill and not sale of additional service was the primary objective.

"This telephone plan," Mr. Leary said, "has improved our customer relations to a marked degree and has served to emphasize to the customer the sincerity of our purpose in wanting to make sure she received satisfactory service. The plan has been successful enough in point of results achieved to warrant our company continuing it in 1945."

Confine Talk to Good-Will

Mr. Leary emphasized the company endeavors to keep the conversation of the telephone follow-up call confined to "good will" discussion. The man (or woman, in 1945) is trained in methods of keeping the housewife customer's mind on the subject of her reaction to service *already performed* and how she liked it.

Every effort is made, according to Mr. Leary, to prevent the conversation from drifting into a stage where-in the customer asks a lot of questions and expects answers on technical phases of service or appliances. The telephone attendant also is cautioned against letting the conversation deviate from its pre-determined purpose—measuring customer reaction to the quality of the service already performed—into an out-and-out sales talk for additional service.

In 1944, according to Mr. Leary, a male telephone attendant was used exclusively for the purpose of making follow-up good-will calls. The man had to be relieved on an average of every 30 days because, after that length of time, he would have developed a tendency to get away from the primary good-will purpose of the call by straying into straight salesmanship.

Try Girl on Calls This Year

Portland Gas & Coke Co., Mr. Leary declared, decided to try using a girl on that job this year. The 1944 experience, he said, proved that housewives are more apt to ask a man too many technical questions, which is not what the utility is after in this particular operation, in which customer reaction alone is the objective. The theory on which the company is operating in replacing the male phone attendant with a girl this year is that women (who constitute the bulk of persons to whom the

calls are made) would be less inclined to ask technical questions of a girl.

The supervisors emphasize to the telephone attendant that he (or she) is not there to *sell* additional service, but only to accept a supplementary order if it is requested by the housewife in the natural course of the conversation.

7707 Calls in 1944

During 1944 a total of 7707 goodwill calls, made after service orders had been finished, were completed. The company regards a "completed" call as one in which the customer has actually been contacted; an "incomplete" call as one in which the call was made and no answer received at the other end.

In an analysis prepared by D. E. Farmer of the company's staff, of the 7707 calls completed in 1944, the following tabulation of results is set forth:

Customer Relations Improved

The report stated that the results reflected in the first two groups (in table below) have contributed substantially to the Portland Gas & Coke Co.'s customer relation program.

"As a matter of fact," the report stated, "it is quite probable that we secure an even better reaction from these customers where additional service is requested, for the reason that such additional work emphasizes our sincere desire to assure the customer of completely satisfactory appliance operation."

Mr. Leary and Mr. Farmer pointed out that a study of service calls on which additional service was requested has been of interest and distinct value as a check on company service procedures. It has also served as an aid in the firm's perpetual educational program.

Review of Phone Calls Made

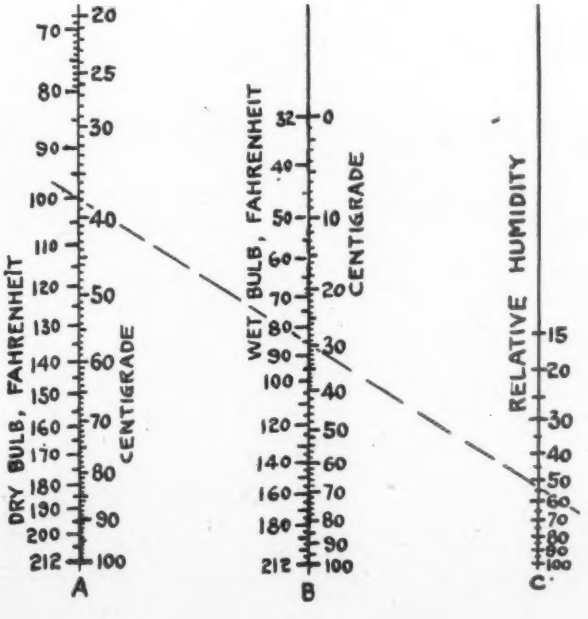
These calls, the report accented, were reviewed carefully to find out whether or not the further service was necessary on the same appliance covered in the original request, or whether it came from other gas appliances on the premises. At the same time, the report pointed out, it is possible to make a reasonable determination as to whether the work was required because of inadequate or incomplete service on the first call, or whether it resulted from circumstances which were beyond the control or the responsibility of the serviceman.

"On this basis, and on the 515 additional service calls issued," the report summed up the customer department's conclusions of the telephone follow-up plan, "we concluded that 196 were chargeable to failure of the serviceman to observe or satisfactorily correct operating difficulties.

"Expressed in another way, if we assume that the 7707 completed telephone calls are representative of our entire volume, it might be concluded that we are failing to do a complete service job on 2.5% of our calls. If this is true, that is the figure which warrants every effort to reduce."

	No. of Calls	*% of Total*
Satisfactory Response:		
Customer expressed satisfaction with work performed and, almost without exception, thanked representative for our usual interest	6365	82.5
Unusual Response:		
Complimentary comments on scope of service, promptness, past associations with the company, interest in new gas appliances, etc.	827	10.7
Further service requested	514	6.8
Total completed	7707	100.00
No contacts after two attempts on successive days	1004	11.5
Grand total of calls made	8711	

Metallizing: Covering a wide range of applications of this process used largely in industrial maintenance work, Metallizing Engineering Co., 38-12 30th Street, Long Island City 1, N. Y., has combined their issues of *Metco News* from 1940 to 1944 in a bound volume, completely indexed under subjects.



What Is the Relative Humidity?

By
W. F. Schaphorst, M.E.
Newark, N. J.

Here is a handy chart for quickly finding relative humidity. Tables and computations are unnecessary. Run a straight line through the dry bulb temperature, column A, and the wet bulb temperature, column B, and the relative humidity is instantly given at the intersection with column C. Thus if the dry bulb temperature is 100 degrees F. and the wet bulb temperature 85 degrees F., the dotted line drawn across the chart shows that the relative humidity, column C, is 54 per cent.

The chart is based on a special formula developed by the U. S. Bureau of Standards. The formula has been tested by the Bureau for dry bulb temperatures between 20 and 100 degrees Centigrade. An important advantage of this chart lies in the fact that it gives temperatures in both Fahrenheit and Centigrade.

Review of Research in Kitchen Ventilation

By
Leon Ourusoff,
Member, Technical Advisory Subcommittee
for Project No. 1,
Domestic Gas Cooking Research

and

R. C. Gregg,
Assistant Chief Research Engineer
American Gas Association Testing
Laboratories

THE PRESENT building trend is toward greater numbers of small homes with correspondingly compact kitchens. In keeping with modern gas appliance design and to take full advantage of reduced space, the entire kitchen is being modernized in appearance and utility. To coordinate these trends into a harmonious unit, the Coordinated Gas Kitchen Committee of the American Gas Association has initiated a cooperative program now under way, participated in by gas appliance manufacturers, gas utilities, and manufacturers of kitchen cabinets, sinks and other related accessories. These interested groups have united to develop as far as possible the standardization of various kitchen components and to promote the "New Freedom Gas Kitchen" with the ultimate objective of providing American homes with coordinated, comfortable, clean and efficient kitchens.

In addition to the standardization of dimensions and promotional phases of this program, attention is being given to the important feature of kitchen ventilation. The need for advancement in that technique has been intensified by the necessity of keeping abreast with modern concepts of kitchen design requiring something better than the use of unsightly canopy hoods or conventional ventilating fans installed in the wall. Recognizing the need for a scientific study of this problem, the American Gas Association Technical Advisory Subcommittee for Project No. 1, Domestic Gas Cooking Research, recommended to the Association's Committee on Domestic Gas Research that the domestic gas research program be expanded to cover a study of the fundamentals of kitchen ventilation together with the exploration of possibilities for effective and coordinated ventilating assemblies. This recommendation was accepted and approved by the Committee on Domestic Gas Research and the project was assigned to the American Gas Association Testing Laboratories in May, 1944.

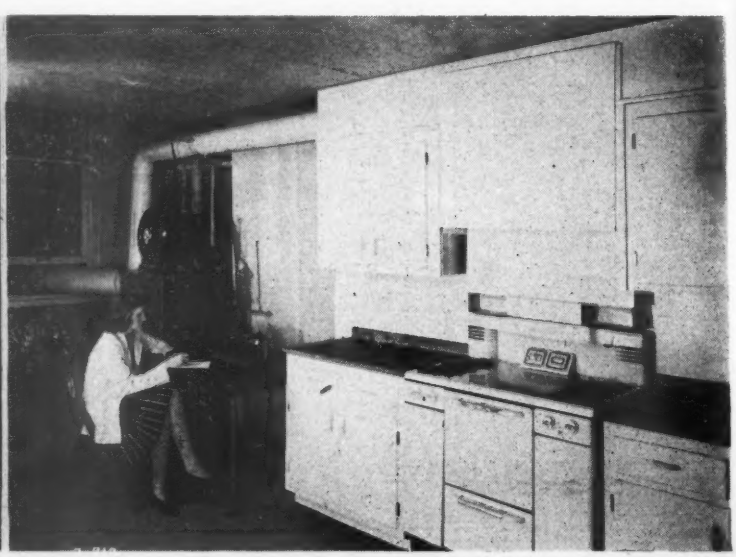
Studies to date have entailed removal of excess heat, moisture and cooking odors resulting from operation of the domestic gas range. Other phases of kitchen ventilation as related to removal of grease and to the operation of gas refrigerators have been started only recently.

A typical test assembly is shown in Fig. 1. It will be noted that the gas range is placed between 2 standard sized kitchen cabinets. The hood located above the range is adjustable in height (for purposes of test) and conforms to the general cabinet design. It is connected to a rectangular duct at the top. In the normal installation, space above the cabinet is unusable because of its height above the floor. In a practical application, the exhaust blower could be incorporated in the cabinet above the range as a unit assembly or placed near the exhaust outlet. As this style of ventilating hood which, for convenience may be designated as the cabinet type hood, indicated great possibilities from the standpoint of appearance and standardization of assembly, an extensive investigation of its performance under various conditions was conducted. The performance of 2 other types of ventilating hoods was also studied. These were a modified wall type hood and a full canopy type hood shown in Figs. 2 and 3, respectively.

All 3 types of hoods were connected to a cage type blower capable of

Fig. 1. General View of Test Assembly Shows Cabinet Type Hood with Openings (not shown) on Bottom of Center Portion of Cabinet Structure Directly Above Range.

Fig. 2. General View Shows Wall Type Hood with Openings Directly Above Back Splash.



exhausting air at any desired rate up to 900 cfm. Efficiency of heat removal from the kitchen was determined from the quantity of air discharged and the temperature rise in the exhaust duct above the average room temperature.

Heat removal with the cabinet type hood was studied to determine the effect of height of its inlet above the range top and the area and location of openings comprising the inlet in the front, rear or sides of the bottom of the hood. These openings (not visible in Fig. 1) are located along the bottom of center cabinet structure located directly above the range top. The side openings referred to consist of 6 x 13 in. portions on each side of this hood bottom through which gaseous products resulting from cooking are drawn. Front and rear openings are 4 x 36 in. (entire width of range) located along front and rear edges, respectively, of the bottom of the hood. Results obtained with 900 cfm air withdrawal rate and at various heights ranging from 18 to 42 in. above the range top are presented in Fig. 4. From these curves it is apparent that height of the hood inlet within the aforementioned limits has no significant effect on the amount of heat removed. Similar studies with other arrangement of openings at sides, front and rear of the bottom of the hood ranging in area from 74 to 462 sq. in. indicated that there is some slight advantage in having a large opening. It was likewise indicated that for a divided top range, better results were obtained with side openings.

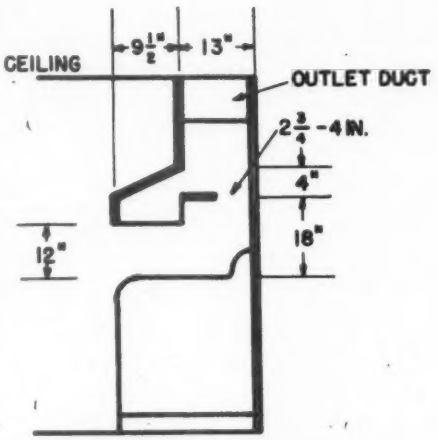


FIG. 3 ESSENTIAL DIMENSIONS OF CANOPY TYPE VENTILATING HOOD.

The rate of air withdrawal, naturally, is a governing factor in effecting heat removal. Results obtained with side openings and with various rates of air withdrawal are shown in Fig. 5. The upper curve represents the efficiency of heat removal with the 2 rear burners and oven burner in operation. It will be noted that much less efficient heat removal is obtained when operating the front 2 top burners and the oven burner than with the oven and rear top burners in use. Also, it is significant that the divergence of these curves is greatest at low rates of air withdrawal. An attempt was made to improve the efficiency of heat removal from the front burners by use of an auxiliary opening 24 in. wide x 2 in. high at the front of the cabinet just below the ceiling level. This expedient, however, did not indicate any immediate advantage in heat removal as shown by the lower curve in Fig. 5.

A similar series of tests were conducted with a wall type ventilating hood. This is shown in Fig. 2 and consists of a 4 x 36 in. opening located just above the back-splash of the range, connected to the ventilating system through a channel in front of the back wall. Results of heat removal tests with this hood are shown in Fig. 6. In general, the heat removal curves followed the same trends but with slightly lower values than those obtained with the cabinet hood. In these tests the central portion of the opening was closed to provide 2 openings directly back of each section of the divided top range. This arrangement, as would be expected, is more effective for this type of construction. Efficiency of removal of heat due to oven operation was found to be high because the oven vents were directly under and adjacent to the ventilating hood openings.

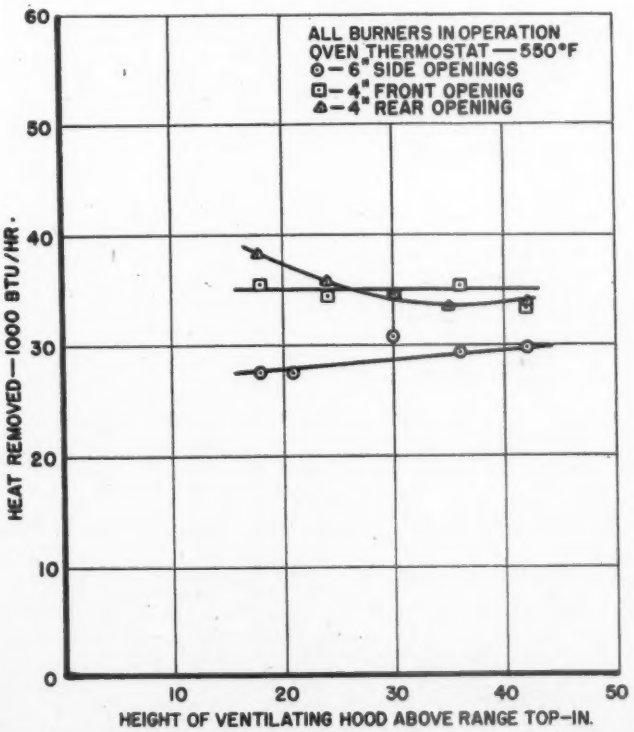


FIG. 4 EFFECT OF HEIGHT OF CABINET TYPE VENTILATING HOOD ON HEAT REMOVAL.

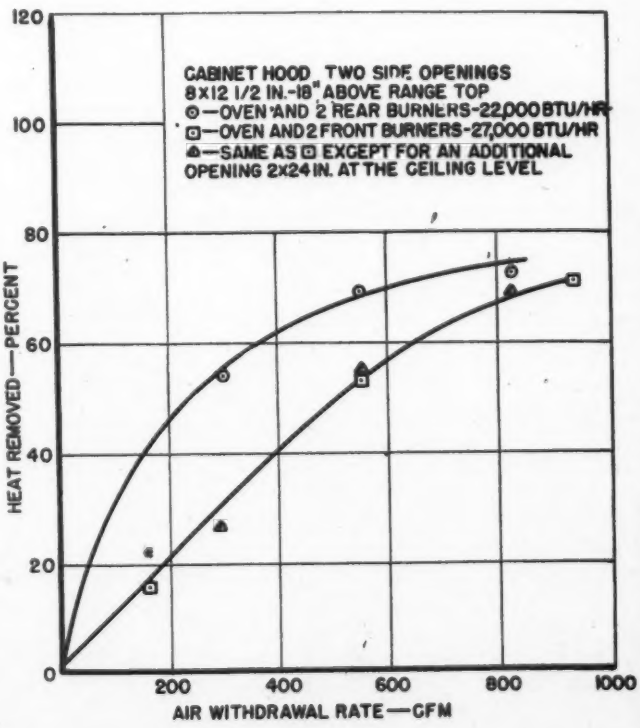


FIG. 5 EFFECT OF RATE AIR WITHDRAWAL ON EFFICIENCY OF HEAT REMOVAL WITH CABINET TYPE HOOD.

Several modifications of this wall type hood were made in an effort to obtain more effective heat removal from the front burners. The hood opening was raised to a height of 24 in. above the cooking top and instead of 2 openings as just described, a single 2 in. slot was extended for the full width of the duct (36 in.). This was found to give practically the same efficiency of heat removal as the original wall type hood. Results are presented in Table 1 together with those obtained with the same hood equipped with a 6 in. extension of the hood opening toward the front of the range. This extension consisted of a channel 36 in. wide x 2 in. directed downward toward the range top at approximately a 45 degree angle.

The latter type hood also gave almost identical performance to that obtained with the other 2. Apparently, the maximum withdrawal of heat from the front burners with this type of hood is about 25 and 50 per cent, respectively, at 300 and 500 cfm for any hood opening extending towards the front not farther than standard cabinet depth (13 in.).

A series of heat removal tests were made with a full canopy hood as shown in Fig. 3, constructed as a visor-like extension to a cabinet type hood. This particular design was selected for study because it could be made adjustable so that the visor extension could be retracted or even concealed when not in use. With this arrangement the efficiency of heat removal was from 60 to 65 per cent at 300 cfm and from 66 to 71 per cent at 500 cfm, respectively. It was equally effective for front or rear burners. It is doubtful if the efficiency of this hood is sufficiently high to justify its preference to the cabinet type hood from the standpoint of heat removal from rear top burners or oven burner. Although it did indicate considerable advantage, particularly with front top burners, this same improvement could be effected with the cabinet hood by placing the 4 top burners in line at the rear of the top section.

In the final analysis the worth of any kitchen ventilating plan largely depends on its effectiveness in preventing an excessive rise in kitchen temperature as a result of cooking operations. This is difficult to determine in a laboratory because conditions in the field are so varied that any one particular test arrangement could be representative at the most of only a few service conditions. Rise in kitchen temperature depends upon many factors including size and location of the kitchen, outside temperature conditions and quantity of heat liberated.

A number of room temperature rise determinations were carried out with different types of ventilating hoods and with both the ovens and top burners in operation. Representative results are presented in Fig. 7 including those obtained with both high and low ceiling. A slightly higher temperature rise was indicated for the low ceiling (8 ft) compared with the high ceiling (12 ft) but the difference was not as great as might be expected. The floor space was somewhat larger (12 x 20)

Table 1

Comparative Efficiencies of Heat Removal Obtained With Different Adaptations of the Lower Wall Type Hood

Type of Hood Opening In.	*Height Above Cooking Top In.*	*Air Withdrawal Cfm.*	*Burners in Operation*	*% Heat Removed*
2—4 x 9½	10	300	2 front and oven	25.0
2—4 x9½	10	560	2 front and oven	53.0
1—36 x 2	18	296	2 front and oven	26.0
1—36 x 2	18	567	2 front and oven	50.0
1—36 x 2	14¾	280	2 front and oven	25.3
1—36 x 2	14¾	580	2 front and oven	54.1

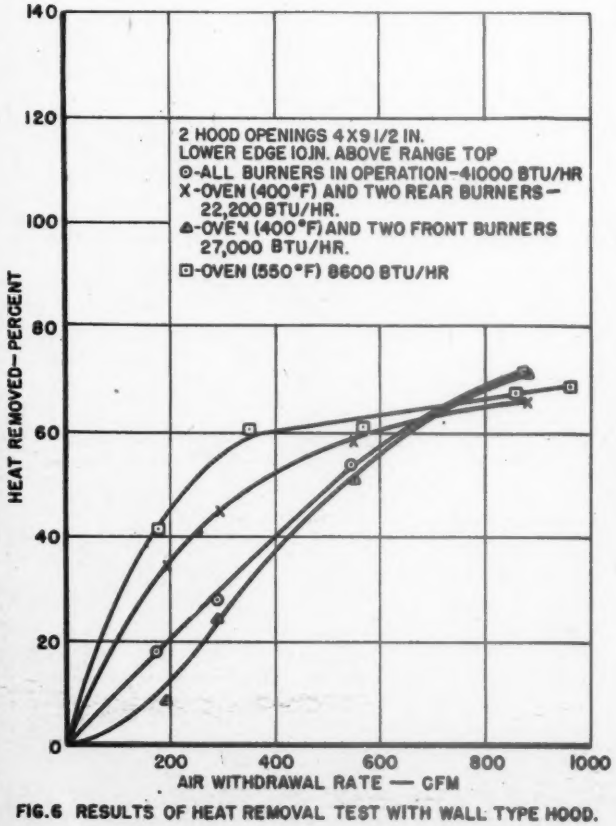


FIG. 6 RESULTS OF HEAT REMOVAL TEST WITH WALL TYPE HOOD.

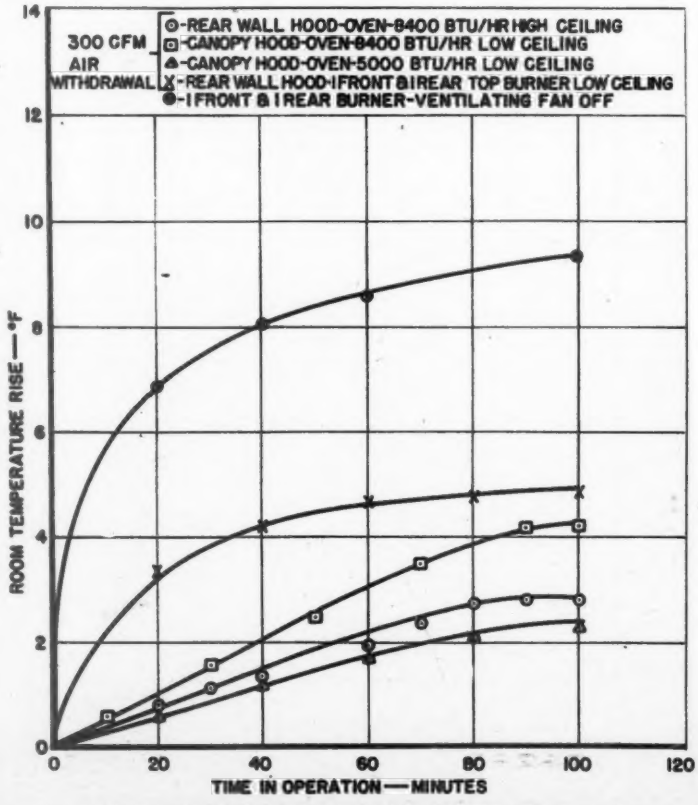


FIG. 7 ROOM TEMPERATURE RISE WITH AND WITHOUT VENTILATING FAN.

than in an average kitchen and the 8 ft. ceiling extended only 16 ft. instead of the full length of the kitchen. This fact may account for the small difference in temperature rise. It seems reasonable, however, that the use of a ventilating fan would lessen the effect of room size on temperature rise. In general the results indicate that a fairly low rate of air withdrawal can obviate an excessive rise in room temperature over the average cooking period. A comparison of the 2 upper curves will give an indication of the advantage gained by use of a kitchen ventilating fan.

Removal of moisture formerly was not looked upon as a factor of major importance in kitchen ventilation, although in warm weather, moisture contributes materially to the rise in "effective temperature." With the advent of home air conditioning and the present trend toward small, well insulated homes, avoidance of excessive moisture in the kitchen and living spaces has become a significant problem in winter and in summer. Experimental data on moisture removal with different designs of ventilating hoods indicated that it is easier to remove excessive moisture than excessive heat.

All moisture produced from boiling water in 9 in. pans above the 2 rear burners, including that produced by combustion, was removed by each of the 3 types of hoods at a 300 cfm rate of air withdrawal. The canopy type hood was equally effective in removing moisture from the front burners and was reasonably effective at rates as low as 170 cfm. The wall type hood was least effective in removing moisture from the front burners—55 per cent at 300 cfm. The cabinet type was reasonably efficient —70 per cent at 300 cfm. The latter value could be increased to 84 per cent by the use of an auxiliary opening 2 x 24 in. just below the ceiling level.

Certain cooking odors are much more difficult to remove than either moisture or heat. This is understandable even though the odor particles are present in very small quantities. A relatively small number of particles that have diffused throughout the room usually are sufficient to impart a noticeable odor to the atmosphere. It is obvious that very high rates of air withdrawal would be required to entirely remove certain odors from any given room.

Many cooking odors might be considered desirable when confined to the kitchen. The real problem is to prevent the diffusion of odors from the kitchen into other spaces in the house. It was found possible (with a 300 cfm rate of air withdrawal) to retain within the kitchen practically all odors produced by cooking of most foods when the inlet air was drawn through the kitchen door. Of course, all odors produced by cooking foods such as cabbage, cauliflower and onions could not be entirely confined to the kitchen but were diluted to an acceptable degree in adjoining rooms.

Odors from roasting meat in the oven could be almost completely removed from the kitchen with any of the 3 types of hoods studied. None of the ventilating hoods were effective in entirely removing pronounced cooking odors produced from preparing foods over the top burners. The canopy type hood was the most effective but even so, required very high rates of air withdrawal for best results.

From information obtained to date, it appears that the effectiveness of ventilating a kitchen from the standpoints of removal of excess heat, moisture and cooking odors is highly dependent upon the rate of air withdrawal. Results of tests indicate that, based on the assumption that 300 cfm is the maximum practical rate of air withdrawal, a cabinet type ventilating hood offers good possibilities from the overall standpoints of appearance, performance and simplicity of design and installation. Removal of moisture is comparatively easy since practically all moisture produced by rear top burners and oven can be removed with any of the 3 types of hoods studied. With the cabinet type hood removal of approximately 70 to 80 per cent of the moisture produced by the front top burners can be effected.

Although all odors cannot be removed from the kitchen even with very high rates of air withdrawal, proper ventilation aids materially in confining odors to the kitchen.

Aside from the studies made to date, 2 additional factors should be borne in mind, namely:

1. **Although hood ventilators do not instantly remove all heat dissipated by cooking operations, at least they cause a deflection of heat away from the person standing near the range or elsewhere in the kitchen, while conventional type ventilators may cause the opposite to happen.**
2. **Likewise, hood ventilators have the important advantage, not normally possessed by conventional fans, of preventing the release of grease laden vapors into the kitchen thereby eliminating the necessity for substantial upkeep of wall and ceiling surfaces.**

This outline should be viewed as a presentation of preliminary findings some of which are not as yet conclusive. Only a limited number of ventilator designs have been tried as the initial purpose of this study was to assemble basic information rather than to develop specific designs.

Presented at American Gas Association Technical Conference on Domestic Gas Research, Cleveland, Ohio, May 8-9, 1945.

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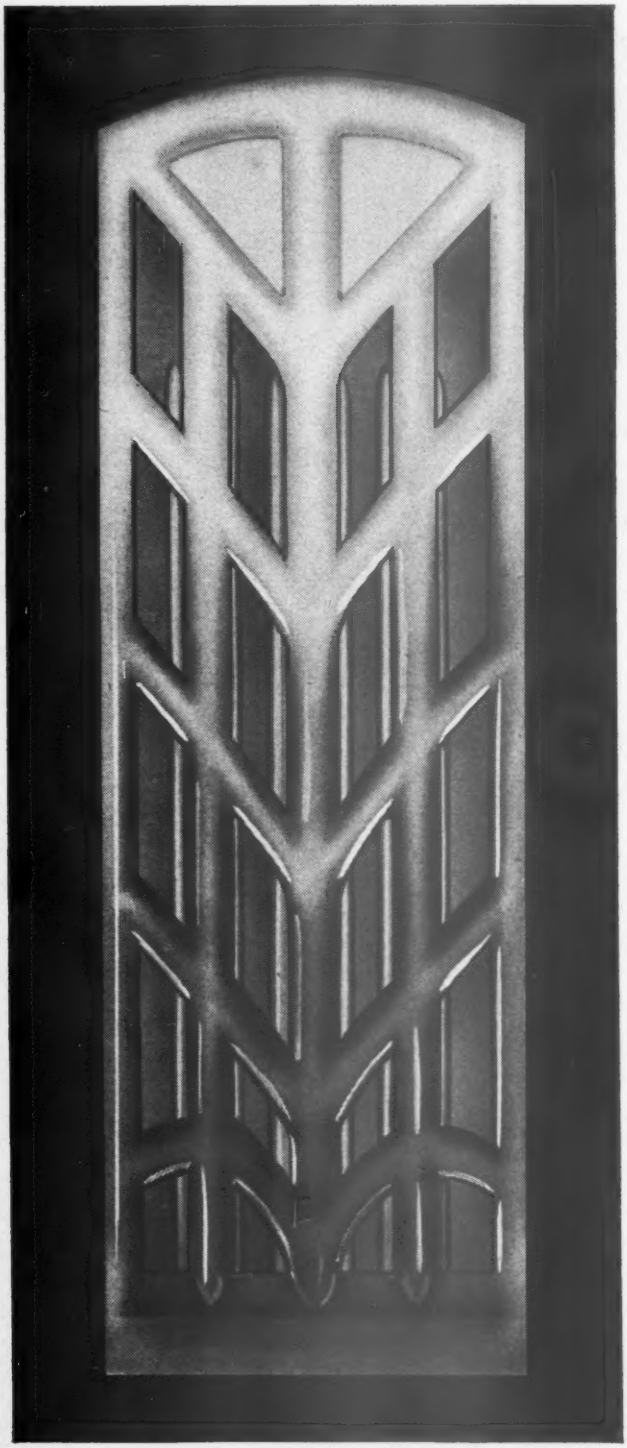
If you haven't already registered for these clinics, write R. E. Williams, Chairman, Committee on Selection and Training of Domestic Sales Personnel, American Gas Association, 420 Lexington Avenue, New York City. Or write any regional office of Servel, Inc.

SERVEL, Inc. EVANSVILLE 20, IND.



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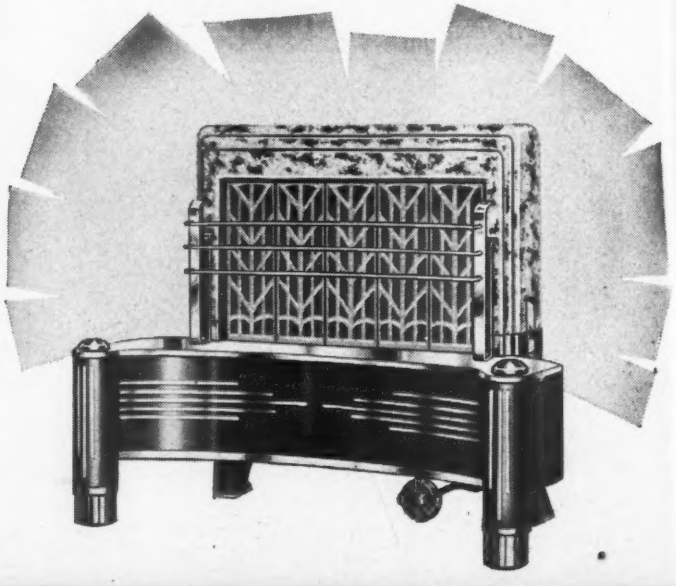

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Natural Gas in the Upbuilding of the South

By

F. S. Kelly, Jr.

President, Southern Gas Association, Shreveport, La.

ONE of the greatest of the many important industries of the South, the natural gas business, has attained its present stature through a road of vicissitudes and difficulties. Its history has been a hectic one, and it is only recently that it has become stabilized to the point where it is no longer regarded as a speculation.

In its early days, the natural gas industry was centered largely in Pennsylvania and West Virginia, and for the most part was localized, the communities served being close to the gas fields. Usually, gas—as in many areas today—was secondary to oil, and seldom was very serious attention paid to it, for then it had little value, and few were ready to invest in expensive distribution systems.

Because of an entire lack of geological knowledge, the reserves were believed to be inexhaustible, and as a consequence rates were usually ridiculously low. However, many of these "inexhaustible reserves" soon became exhausted, and frequently a town found itself out of gas even before the ditch had settled on its mains. Later, in spite of the lessons learned, this policy was followed generally by other companies, as the industry moved West, and resulted in a majority of the early gas companies going bankrupt when they were hardly established.

Migration Westward

The natural gas industry continued to move West, either leading or following the oil industry, the center of production moving progressively west to Ohio in 1909, to Southern Illinois in 1919, to Central Oklahoma in 1937, and in the past few years to Texas and Louisiana. The history of the early Southwest gas companies was practically identical with that of the Appalachian and Mid-Western regions. Numerous small gas fields were developed, and the towns adjacent were piped to them at relatively small cost, and with unusually low initial rates, a procedure that was exactly the reverse of that of the electric industry, which started with small local power plants and high initial rates, thereby enabling them to reduce rates, as the inter-connected high line systems developed, thus gradually maintaining financial stability.

During the late 20's and early 30's, as a result of improved manufacturing and construction techniques, such as high carbon steel, acetylene, electric welding, medium and high pressure distribution systems, and improved exploration, drilling and production methods, the industry took a new lease on life. Speculative money in the boom days of 1929 and 1930 was available in large quantities, and numerous long distance pipe-lines, such as the Natural Gas Pipeline Company of America, to the Chicago area, the Southern Natural Gas Company, to the Birmingham area, the Mississippi River Fuel Company to the St. Louis area, and other lines, were constructed.

Conservation and Proration

Up to recently a majority of the integral natural gas systems went through the so-called "feast and famine" periods as far as gas production and reserves were concerned, resulting in the necessity of large capital expenditures for the acquisition of additional gas reserves and at inopportune times for a number of companies. Since the discovery and development of the East Texas oil field in 1930, the gas and oil companies, and the State regulatory authorities in the Southwest, have become increasingly conservation conscious. The legal battles regarding the utilization of gas from the Amarillo Field started the gas conservation and proration practices as we know them today, and there is no doubt that these practices will continue and that they will become even more detailed and complex.

I am not one of those who subscribes to the theory that we should keep all of our gas reserves in one state or in the Southwest, as long as they are utilized with reasonable efficiency. This country, the greatest nation the world has ever seen, was developed by free enterprise and free competition under a sympathetic and democratic government, with the whole United States, and to a smaller extent, the world, as its market.

Gas Reserves

The proven gas reserves in the United States, at the present time, are at the highest point in the history of our country. Ten years ago these reserves were estimated at approximately 60 trillion; two years ago they were approximately 85 trillion and one year ago they were approximately 95 trillion. At the French Lick meeting of the Natural Gas Department one year ago the proven and ultimate potential reserves, in the United States, were estimated to be in the neighborhood of 300 trillion. The proven reserves today, when considering recent discoveries, such as the Carthage Field in East Texas with an estimated 8 trillion cubic feet of reserve, are, in my opinion, in excess of 100 trillion. These known gas reserves, on a weight basis, are roughly equivalent to 75% of the proven petroleum reserves of the United States, which approximate 20 billion barrels.

The metered natural gas consumption in 1944, exclusive of carbon black and field use, as estimated by the American Gas Association, was 2 trillion, 190 billion. The Bureau of Mines reports marketed production in 1943 of 3 trillion, 415 billion cubic feet, including carbon black and field uses. This marketed production exceeded 1942 by 12% and it is estimated that the 1944 marketed production will be 3 trillion, 722 billion cubic feet, or an increase of 9%. This natural gas was used in 1943 by 13,787,000 natural and mixed gas customers in over 27 states. Numerous authorities have stated that we have gas reserves sufficient for a minimum of 30 years. With improved conservation practices, deeper drilling and more effective utilization, it is my opinion that this figure could be doubled and still be conservative, over the long-term period.

The proven reserves in the Mid-Continent and Gulf Coast areas were estimated by E. A. Roth in 1942 as being 73 trillion cubic feet, the prospective reserves as 39 trillion cubic feet, or a total of approximately 112 trillion cubic feet. The annual withdrawals in Texas, Louisiana, Arkansas, Oklahoma, Kansas, and New Mexico are estimated at slightly over 2 trillion cubic feet. On this basis, the reserves in the Southwest and Mid-Continent regions

should be sufficient to supply it for at least 50 years.

Fifteen years ago, a 3,000 to 3,500 foot well was considered deep. The average depth, according to P.A.W. reports in 1941, was approximately 5,000 cubic feet. By 1943 it was 6,500 feet. We have, in the last several years, seen several tests drilled to or below 15,000 feet subsea. It is reasonable to assume that drilling equipment of aluminum, magnesium and other rarer metals capable of drilling to depths twice those of the present, will come soon.

Fields of the Future

The geologists state that a majority of the future gas reserves in the United States will be found along the perimeter of the Gulf of Mexico. The gas discoveries in the past few years have extended production from the South Texas Gulf Coast across Louisiana and into Mississippi. Oil has recently been discovered in Alabama. There is, at this time, an active leasing campaign under way in Alabama, Georgia, and Florida. The Atlantic Seaboard, from Virginia south is also being considered as prospective gas and oil territory, and leasing in that section has started.

As you know, approximately 98% of the fuel resources of the United States is represented by our coal reserves, which are estimated at over three trillion tons. The Natural Resources Planning Board reports that Texas alone has lignite coal reserves of approximately 30 billion tons.

The development which natural gas enjoyed in the Southwest prior to the advent of the long transmission line was due primarily to the industrial activities of the regions concerned. This business, according to reliable information, has contributed a substantial part of the fixed charges of some of the major gas companies. If the boiler and low-priced industrial load, which in some instances represents up to 80% of the volume of gas handled, were cut off, or severed under the "end use theory," many companies would be forced to increase their domestic and commercial rates, or they could not earn a fair return on investment.

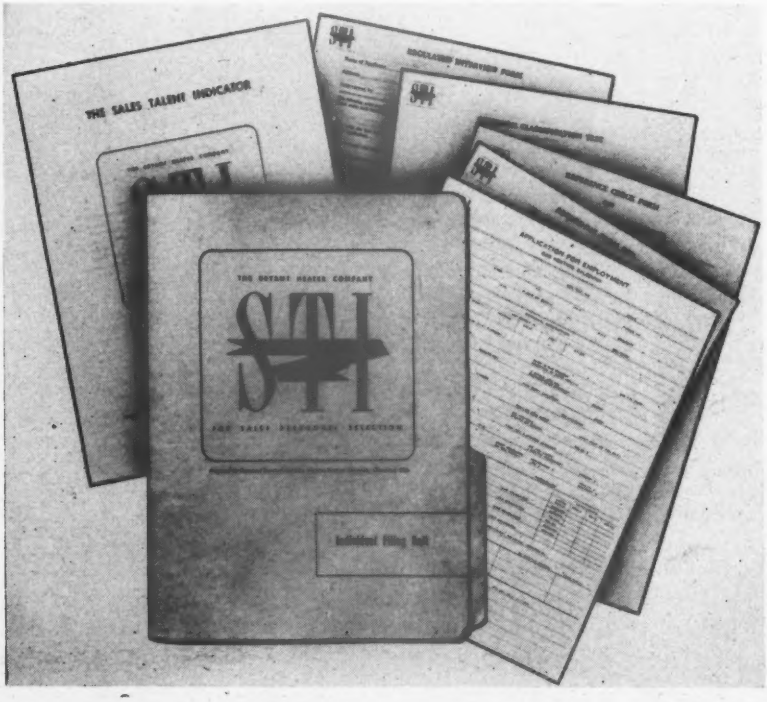
This country, in spite of its many trials and tribulations, has, down the years, continued to progress, and make possible a fuller and happier life for its citizens. I see no reason why this trend should change. Therefore, I am optimistic as to the future for the Southwest, and our industry, assuming that we put our shoulders to the wheel and resolve to overcome all obstacles.

Bryant Sponsors Sales Talent Selection

The Bryant Heater Company has undertaken to aid gas companies, distributors and dealers to select unusually competent gas heating salesmen for postwar by engaging the Personnel Research Institute of Western Reserve University to prepare special selection procedures.

The Bryant Sales Talent Indicator Test is the heart of the resulting Bryant S.T.I. Plan evaluated and standardized on, and for gas heating salesmen in particular. Dr. J. L. Otis, professor of psychology at Western Reserve University, is head of the Institute which prepared the plan, and Dr. Clare W. Graves, senior member of the Institute, supervised the field working according to C. F. Cushing, distribution manager of the Bryant Heater Company.

Although not an infallible hiring guide, the Bryant S.T.I. Plan is based on five major analyses of the applicant's capabilities and check studies have shown that 82 per cent of salesmen thus chosen will be above the average of men employed through methods now commonly used.



The Sales Talent Indicator includes application form, and forms for record, reference check, salesman classification test and interview.

Of these five analyses, the most useful is the Sales Talent Indicator Test, which was constructed by applying a number of standard psychological tests to some 200 gas heating salesmen divided into groups of 100 men each. Members of the first group were men with top selling records in the gas heating field, while the other group was made up of men whose sales work was known to be below par.

Selected questions which elicited uniform answers from the top group and contrary answers from the bottom group permit the interviewer to assemble a fairly complete personality portrait of the applicant. If this portrait is markedly similar to the composite test picture of men known to be successful gas heating salesmen, the applicant will probably enjoy a similar success. Applicants who respond in conformity with the below-level sales group are equally likely to prove unsatisfactory as salesmen.

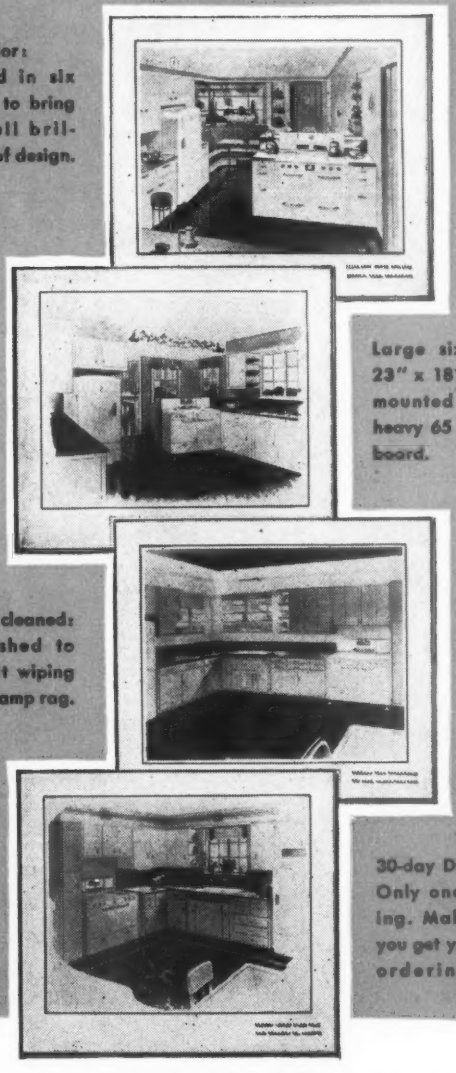
An individual filing unit for each applicant includes, in addition to the Sales Talent Indicator Test, four other significant analyses. These are a Weighted Application Blank, A Regulated Interview Form, a Salesman Classification Test (a test of intelligence) and a Mechanical Aptitude Test which may be required of salesmen who are expected to do their own engineering.

PRE-SELL POSTWAR PROSPECTS NOW

USE *Magic Chef* KITCHEN PROGRAM

The May issue of Magic Chef Magazine announces a new and complete program of kitchen promotion. If you have not received a copy of this issue, write at once to your nearest American Stove office. The material shown below represents but two of the items available.

Display a set of these attractive six-color displays in your window and on your sales floor. They will encourage prospects to discuss kitchens with you and reveal their appliance needs.



Full color: Printed in six colors to bring out full brilliance of design.

Large size: 23" x 18½" mounted on heavy 65 pt. board.

Easily cleaned: Varnished to permit wiping with damp rag.

30-day Delivery: Only one printing. Make sure you get yours by ordering now.

Many of your townspeople are planning new homes or alterations. Start building postwar business now by using these ads in your local newspaper.

When Peace Returns You Can Have
a NEW FREEDOM Gas Kitchen Like This
The kitchen is the most lived-in room in the house
...let us help you give it personality and livable charm
Build the Kitchen of Your Dreams Around a New
MAGIC CHEF GAS RANGE
When Our Boys Come Back You Can Have
a NEW FREEDOM Gas Kitchen Like This
The kitchen is the WORK SHOP of your home
...is it you prepare 1000 MEALS each year!
There is no fuel so fast, so economical as gas.
For cooking, refrigeration, home heating, water heating, and air conditioning, gas is best.
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Winter-Summer Domestic Water Heating From Gas Fired Boilers

By

Gebhard C. Beck
Gas Utilization Engineer
The Brooklyn Union Gas Co.

OUR EXPERIENCE with coils in gas fired boilers for the supply of domestic hot water began in 1936. At that time competitive fuels were highly successful in merchandising a single appliance to supply both space heating and domestic hot water all year round.

Our investigations soon convinced us that we had perhaps "missed a bet" in not having similar gas appliances to offer to a public already sold on this method of water heating.

Equipment of this type offered certain advantages, among which are:

1. Single unit, one less to service, purchase, warehouse, deliver.
2. Lower initial investment cost.—Less space in cellar.
3. It would eliminate yearly start-ups and shut-downs of heating plant.
4. Increase life of boiler since all year operation eliminated the deterioration due to summer lay-over of sections and controls.
5. Reduce maintenance because of same reason.
6. Would give us equipment to meet public desire.

Its apparent disadvantages were:

1. Higher consumption during summer months when compared to gas-fired storage water heater.
2. Every care must be taken to insure that equipment is installed as specified otherwise excessive summer bills and overheated basements might result.

In the spring of 1937, we tried an experimental externally connected instantaneous coil in the home of an employee. We soon learned that insulation is a very important factor in reducing standby loss. It represents the most important factor in summer operating costs.

We were fortunate in having information from this experimental unit and also information obtained from competitive sources on this subject, because we soon were confronted with a number of customers who had purchased, from other agencies, boiler units incorporating instantaneous coils. This they did in spite of proposals of separate gas-fired boilers and water heaters by our Sales Division. We, of course, watched these installations carefully. The information gained enabled us to convince many "die-hards" that coil water heating had a place in our sales effort.

We now have approximately 700 installations. A neighboring company, The Brooklyn Borough Gas Company, has approximately 350.

Equipment

There are four principal types of installations on steam and hot water boilers. They are shown by diagrams in Figure I:

1. **External Slow Recovery Coil with Storage Tank.**
2. **External Tankless Instantaneous Coil.**
3. **Built-in Slow Recovery Coil with Storage Tank.**
4. **Built-in Tankless Instantaneous Coil.**

Operating costs are highest for method one and lowest for method four.

We do not find it advisable from an investment cost standpoint to install external coils on existing boilers in one-family homes. The cost of the coils and labor will approximate that of a separate gas-fired water heater. However, in multi-family homes (3-family and over) and commercial establishments (served under our Non-Residential General Rate and Non-Residential Heating Rate) where existing boilers are in good condition, such an installation may be justified from a rate standpoint. Under our commercial space heating rate, coil operation is permissible at a lower unit gas cost than would be obtained by a separate gas water heater under the general commercial gas rate. The saving may amount to as much as 33⅓%. This saving is credited to the (non-residential) rate structure and not to the method of water heating. It does not apply to domestic house-heating, as these customers are served under the residential rate which gets down to the low rate of 50 cents per thousand cubic feet very quickly.

When sizing the boiler, in our opinion, no additional radiation need be added for instantaneous coils. Many engineers will not agree with this. It is our belief that at the time of the morning heating up period, the thermostat will have been satisfied before any hot water is drawn. Practice has supported this contention. On the other hand, we do believe 50 square feet of C. I. radiation per bath or one square foot per gallon storage tank, whichever is the larger, should be added for slow recovery coils.

We have found boilers with large water capacity to give the best results. This capactiy should be 25-30 gallons for one family houses.

When connecting coils externally to existing boilers, be certain that coil manufacturers' specifications are followed. On sectional boilers, every section must be drilled and tapped for a common header to the coil. This is exacting work and the expense involved may be high. We have found that in order to get sufficient circulation head on instantaneous coil connections, it is often necessary to install the coil above the water line of the boiler. This adds to the difficulty of the job since on steam installations, piping must be air-tight, otherwise the vacuum will be broken and no boiler water will remain above boiler water level. This type of installation, while rare, has been advertised recently. With built-in coils these difficulties do not exist.

Importance of Insulation

The boiler should be well insulated. It will be shown later that this *factor* is perhaps *the most important* feature of these units, so that operating costs may be low. Another important help in cutting down standby loss is control of cold air movement through boiler during burner off period.

Mixing Valves

Mixing valves are standard requirement with us. We have had fairly good experience with Taco, Watts and Dole valves. Where we

What woman *wills* . . . will be"

She Wants Better Cooking Results

WHEN WOMEN DECIDED that conducting the Saturday night ablutions on the kitchen floor was out-dated they crusaded for bathrooms . . . and *got* them.

And today, knowing the superior cooking results made possible by the Harper Burner System, the overwhelming majority of women *want it*.

They want it because each burner does *double duty* . . . offers one heat for frying and to *start* foods boiling, and another separate heat to *maintain* the cooking. Each burner is actually 2 burners in 1 . . . a burner within a burner . . . both operated by a single handle. The small, inner *cooking* burner can be used entirely independently of the outer *starting* burner. No other top burner possesses this vital advantage, which insures just the right heat for every type of top burner cooking.

Representing today's *ultimate* in top burners, the Harper Burner System is doing much to expand the position of gas as the ideal cooking fuel . . . the top burner *answer* in the AGA campaign of appliance improvement and promotion.

Copr. 1945, Harper-Wyman Co.

On next page
WHAT USERS SAY

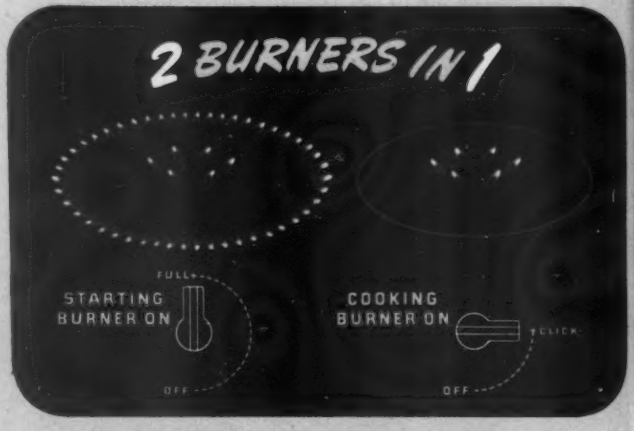
"I find the HARPER BURNER SYSTEM superior in many ways to ordinary top burners."

That is the verdict of Mrs. M. J. Hazlett, 912 E. 34th St., Minneapolis, Minn. She isn't alone in her opinion—thousands of housewives throughout the country agree with her. Moreover, it's a fact that can be proved by simple demonstration on the sales floor—a potent sales factor.

NO DOUBLE BOILER NEEDED—The accurate adjustments of heat possible with the Harper COOKING BURNER permits direct-flame cooking. No need for a double-boiler when cooking cereal, cream sauces, or other foods that burn easily.

IT CUTS GAS BILLS—By actual test, the Harper Way saves up to 39% in gas consumption. Less water need be heated, because the small *cooking* burner boils less away. Also, the *cooking* burner uses less gas—none of the heat is wasted around the sides of the vessel.

POT WATCHING HOURS SAVED—The Harper COOKING BURNER is adjusted so that it takes more than an hour to boil away one cup of water in a covered vessel. The housewife need only use one cup of water for every hour she plans to be absent from the kitchen while food is cooking.



2 BURNERS IN 1—The Harper Burner System is really "2 burners in 1"... a STARTING BURNER plus a small economical COOKING BURNER, both controlled by the same handle. It is subject to finer gradations of low heats than any other top burner. Harper-Wyman Company, 8562 Vincennes Avenue, Chicago 20, Ill.

HARPER BURNER SYSTEM

"HOLDS THE LINES FOR GAS"

HARPER BURNER SYSTEM

—One of the standards of top burner performance under cp

have encountered hand valves (and this seems to be the practice in building developments), we have strongly urged and sold mixing valves to replace the hand valves. We also include a mixing valve in the sale of conversion burner equipment to builders. Where hand valves were replaced by mixing valves, the results amply justified the cost. Mixing valves reduce water wastage, cut hot water costs and prevent scalding. Hand valves require adjustment periodically to compensate for pressure and temperature variations. This, expereince shows, the average home owner will not do. On slow recovery coils, a temperature controller should be installed in the circulation line to the storage tank (see figure 1).

Coils

The amount of coil length in instantaneous coils has a marked effect on satisfactory hot water delivery. Sufficient coil length to give twelve square feet of coil surface area should be minimum requirement for one-family homes. We have had some installations with nine square feet of coil surface area, but these have proven uniformly unsatisfactory.

For multi-family houses and commercial establishments, consult your coil catalog or manufacturers' representative.

We have not made a practice of selling hot water coil equipment in hard water areas. A few experimental installations were made, but these have limed up in periods of nine to eighteen months. To complicate matters, the hardness in this particular area has increased from 250 parts to approximately 700 parts per million. There is a deliming service sold at approximately $6.00 to $8.00 per job, depending on condiitons found. Some of home owners accept this service as part of the home operating expenses regardless of the fuel they use.

Auxiliaries

A domestic hot water pressure relief valve should be installed in the water line to the coil. Where water hammer is encountered, a pressure chamber is desirable.

The boiler water control temperature on steam jobs is maintained by a low limit aquastat usually set 160-180° F.

In forced hot water systems the aquastat is maintained at 170-180° F. Wiring daigrams for all systems should be used only after consultation with your control manufacturers. Some we have used for steam and forced hot water systems are described elsewhere.

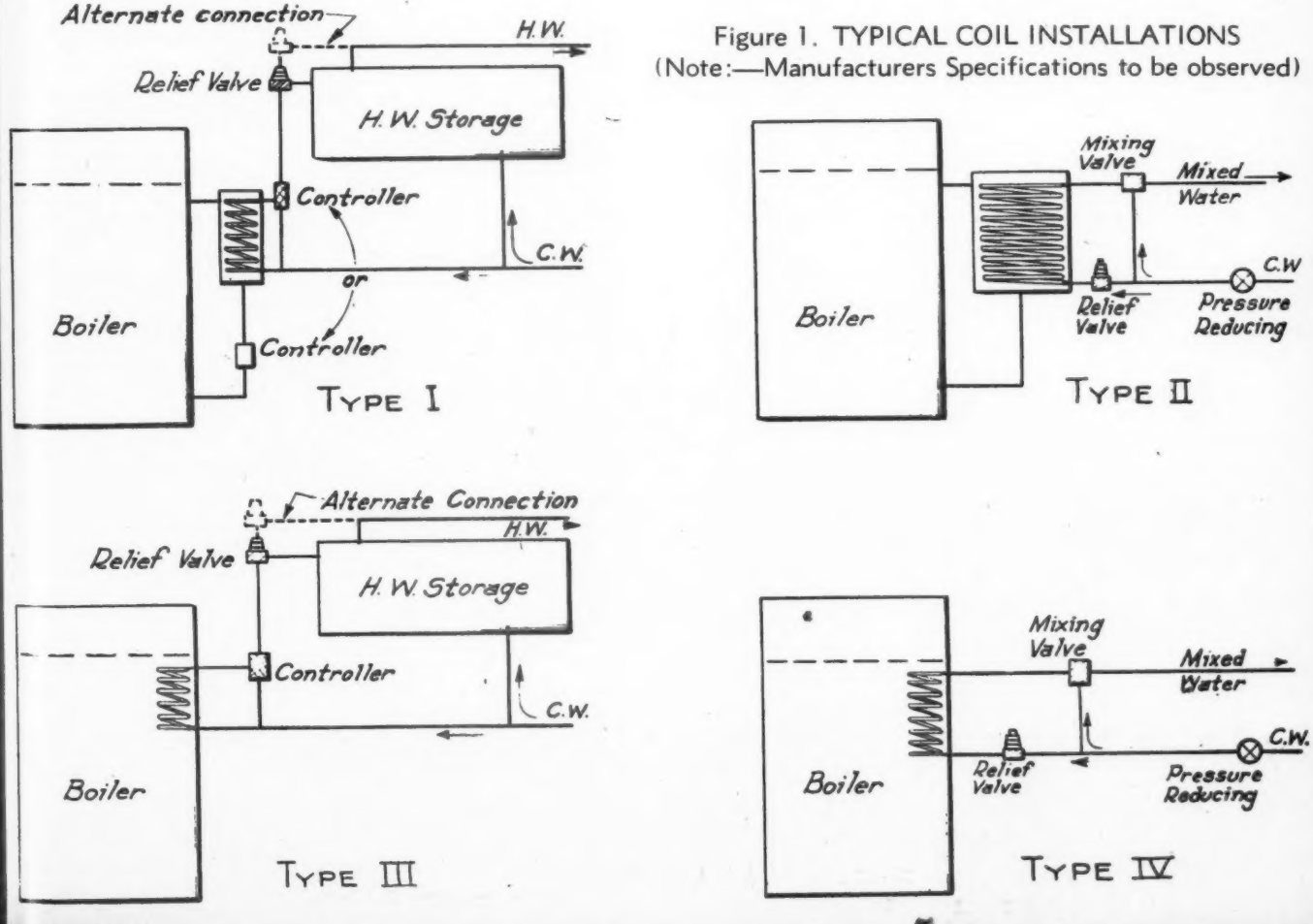
Equipment Cost

Equipment investment cost is lowest on the built-in coil. We are able to and have marketed a boiler with built-in instantaneous coil for approximately $100.00 less than a separate boiler and an individual nonferrous storage water heater. A unit of this type is described later.

Operating Results

In addition to investment costs, operating costs are an important consideration. These differ in this method of water heating when compared to that of the conventional gas-fired storage water heater. The latter operates on a fairly constant monthly consumption rate throughout the year, whereas in the coil method, the summer consumptions are quite high when compared to winter. We have worked out consumptions and costs under various conditions of usage which are shown elsewhere. These estimates show that this method of water heating when taken over a yearly period, compares favorably with that of two units. It would take many years to overcome the benefit of the $100.00

Figure 1. TYPICAL COIL INSTALLATIONS
(Note:—Manufacturers Specifications to be observed)



saving in initial investment cost if the slightly higher operating cost were charged against it. Actual practice has definitely proven our estimates to be quite high. We are certain to reduce these when sales are again resumed.

Summer Operation

As stated previously, economy of summer operation is entirely dependent on the effectiveness of the insulation. This we learned on our experimental installation in 137, when we replaced the conventional ¾" asbestos cement covering on the boiler with 2" Magnesia Block. The monthly gas rate was reduced from 12,000 to 9,000 cubic feet—a reduction of 25%.

An analysis of summer consumptions made in 1940, on 136 installations, the majority of which were instantaneous coils, show the following on steam installations.

	Avg. Monthly Cons. in Cu. Ft. (540 Btu)	
Aprox. Billing Period-Year 1940	*Cooking Gas Included*	*Cooking & Refrigeration Gas Included*
June 15—July 15	7,910 cu. ft.*	9,440 cu. ft.*
July 15—Aug. 15	6,580 "	9,180 "
Aug. 15—Sept. 15	6,290 "	8,540 "
Sept. 15—Oct. 15	9,850 " *	10,510 "*

** In many cases includes some space heating gas.*

If we deduct 1,400 cubic feet for cooking and 3,000 for cooking and refrigeration, the net gas chargeable to hot water supply is well below our estimate.

Only at a later date, that is shortly before Pearl Harbor, we, installed instantaneous coils in forced hot water systems. We have heretofore preferred slow recovery on this type of boiler. Consumption figures available closely follow those for instantaneous coils.

Winter Data:

It is virtually impossible to segregate hot water costs and space heating costs on winter operation. We have arrived at an assumption by deducting standby losses on a number of draw tests in the laboratory. On this basis we were able to formulate a figure of 3,000 cubic feet per month on a 50 gallon daily draw. We are certain that this exceeds that obtained in actual practice. In the case of the experimental boiler mentioned earlier in this discussion, the adjoining record is self-explanatory and substantiates our estimate.

We have also made studies of consumptions on other installations. In the majority of cases the actual winter consumptions for both hot water supply and space heating were within the space heating estimated consumption.

This experience is duplicated in the Brooklyn Boro Gas Company territory, Mr. Philip Baas, Superintendent of Customer Service, in a paper presented February 19, 1941, before the Metropolitan Gas Heating and Air Conditioning Council, stated: "During winter operation, the efciency has been so high that 90% of the installations are obtaining hot water and heating for less than they should be obtaining heat alone based on the actual degree days experienced and the required radiation of the houses."

Of summer consumption he has this to say—"On 31 installations having separate meters on the boilers, the average consumption per meter was 6,300 cubic feet of 540 Btu gas per month during last July and August."

Requirements

In order to be reasonably certain that the equipment we merchandise or approve will operate within our estimates, we have set the following requirements to be met by test.

1. That the hot water delivery be 15 gallons of water during a 5 minute period with a minimum water temperature of 130 degrees F. The initial boiler water temperature to be set at 180 degrees F. and the incoming domestic water temperature to be 60 degrees F.
2. That the standby loss will not exceed 6 cubic feet of 540 Btu gas per hour for a 72 hour period in an average room temperature of 65 degrees F.

These requirements are not difficult to meet. We are not boiler designers and will not presume to dictate how these should be accomplished. The boiler manufacturers' engineers are better fitted to do this. We would suggest, however, that the basic requirements stated before are dependent on factors such as:

1. **Size of boiler and its water content.**
2. **Location of the coil in or on the boiler.**
3. **Circulation of water in all boiler sections.**
4. **Type and location of aquastat.**
5. **Size or surface area of coil.**
6. **Kind of insulation and how it is put on.**
7. **Type of mixing valve.**
8. **Control of air circulation through boiler on burner off periods.**

Conclusions

After seven years of experience with approximately 700 space heating installations equipped with coils for domestic hot water supply, we find:

1. That the operating costs compare favorably with that of the domestic gas storage water heater.
2. The initial investment costs are often lower for the boiler with the built-in coil.
3. That the life expectancy of such equipment is greater than boilers which are shut down each summer.
4. That servicing on the part of the gas company is less and maintenance is reduced.
5. That equipment of this type has a field and place beside the separate boiler unit and storage water heater unit. The heating engineer must weigh all the facts in his survey and select that equipment which best fits his customer's needs. Neither method by itself is the best solution in all cases.
6. That in damp climates, it helps keep cellars dry.
7. That the apparent high summer bills are not a hindrance if carefully explained or if budget billing is used.
8. That it is desirable to have more manufacturers become interested in producing packaged units in order to lessen the added supervision now required in building development projects on equipment bought from many sources.

			Consumption in M Cu. Ft.		
Season	*No. of Days*	*Degree Days*	*Ckg. Refrig. & Wtr. Htg.**	*Hse. Htg.*	*Total*
1936-37	179	3,722	45.8	156.8	202.4
			Ckg. & Refrig.	*Hse. Htg.& Wtr. Htg.***	*Total*
1937-38	181	3,777	24.0	175.4	199.4

**Separate Gas Storage Wtr. Htr. **Instantaneous Coil Attached to Heating Boiler.*

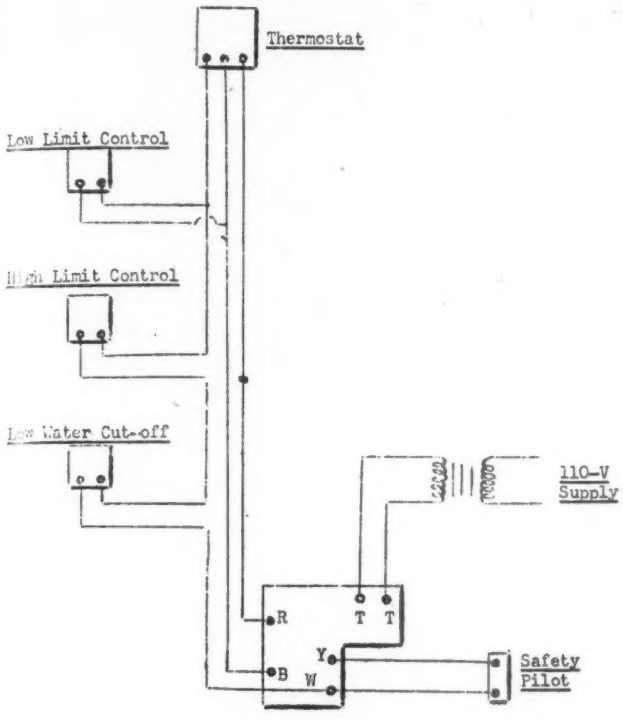


Figure 2:—Wiring diagram of control system for a steam boiler with instantaneous (tankless) or slow recovery (tank) coils. Controls furnished with Simplex boiler for low limit, high limit and low water cut-off.

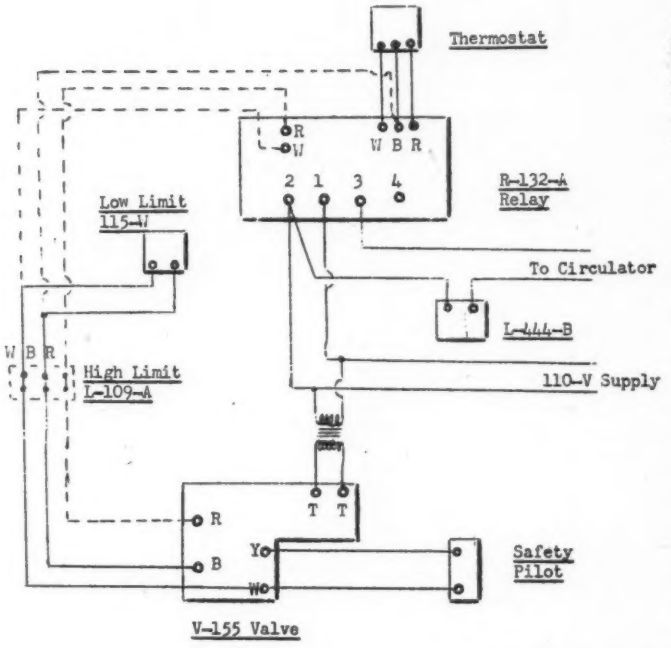


Figure 3:—Wiring diagram of control system for a hotwater boiler. Solid Lines,—slow recovery (tank) coil, 150 B.t.u. Emission system. Dotted lines, additional wiring necessary for slow recovery and instantaneous coils on a high temperature system.

Coil Water Heating—Controls

This will review and clarify the electric control requirements, installation and method of operation for steam and hot water boilers equipped for summer-winter domestic hot water supply.

I. Steam Boilers—with either instantaneous or slow recovery coils.

Controls.—Required and supplied with the Burnham Simplex Boiler as standard equipment:

1. High Limit Control.—P-104-A Minneapolis Honeywell Pressuretrol.
2. Low Limit Control.—Aquastat. —115-W Mercoid or 1118 White Rodgers.

Operation.—This control system will operate in the same manner as a standard steam installation, except that the low limit control will operate the burner to maintain boiler water temperature. The standard aquastat setting is from 160 to 180 degrees F. Figure 2 shows the wiring diagram for this type of installation.

II. Forced Hot Water Systems

(A) *Low Temperature Systems* (150 B.t.u. emission) with slow recovery coil and domestic hot water storage tank:

Controls.—Required and supplied with the Burnham Simplex Boiler as standard equipment:

1. Maintaining aquastat.—115-W Mercoid or 1118 White Rodgers.
2. Reverse acting aquastat (controlling circulator) L-444-B Minneapolis Honeywell.
3. Relay.—R-132-A Minneapolis Honeywell. (Recommended since the circuit can readily be changed to set-up "B" if high boiler water temperature is necessary, by simply adding a high limit aquastat.

Operation.—The boiler water is maintained at 170 to 180 degrees F. by the aquastat. When the thermostat calls for heat, the circulator starts but will shut off if the boiler water temperature drops below the setting of the reverse acting aquastat. The thermostat does not control the burner operation. Figure 3 (solid lines) shows the wiring for installation "A." The standard setting for the maintaining aquastat is 170 to 180 degrees as stated above. The reverse acting aquastat is normally set at 110 to 125 degrees.

In the event that boiler water temperatures of 180 degrees are inadequate to properly heat under extreme winter conditions, it is necessary to add a high limit aquastat and change the control circuit to set-up "B." The only alternative is to maintain adequate boiler water temperatures for the winter by increasing the maintaining aquastat setting. This makes necessary a reduction of this setting at the end of each heating season, and an increase of this setting at the start of each season. Maintaining the high water temperatures during the summer is inefficient and uneconomical.

(B) *High Temperature Systems* (200 B.t.u. emission) with either instantaneous or slow recovery coil:

Controls.—Required and supplied with the Burnham Simplex Boiler as standard equipment:

1. High Limit Aquastat.—L-109-A Minneapolis Honeywell, range from 140 to 240 degrees F.
2. Low Limit Aquastat.—115-W Mercoid or 1118 White Rodgers.
3. Reverse Acting Aquastat.—L-444-B Minneapolis Honeywell.
4. Relay.—R-132-A Minneapolis Honeywell.

Operation.—Boiler water temperature is maintained by the low limit aquastat. When the thermostat calls for heat, the circulator and burner are started. The circulator is stopped by the reverse acting aquastat if

boiler water temperature drops below a predetermined setting.

With an instantaneous coil, the reverse acting aquastat must be set at approximately the same temperature as the low limit aquastat. This will prevent the operation of the circulator when the boiler water temperature is lowered by cool water returned from the heating system, or by demands made by the domestic hot water supply. It is necessary to maintain high temperatures in the boiler at all times to insure satisfactory output from the instantaneous coil.

With a slow recovery coil and storage tank for domestic hot water, the reverse acting aquastat can be set considerably lower.

Figure 3 (solid and dotted lines) shows the wiring diagram for this type of installation.

Standard settings for the low limit aquastat are 160 to 180 degrees F. Standard settings for the reverse acting aquastat are 160 to 180 degrees, with instantaneous coils, and 110 to 125 degrees with slow recovery coils.

Note: The above systems controlled by electric clock thermostats—for example, the T-111-A Chronotherm—must be supplied with a switch to eliminate thermostatic control in non-heating months. This is supplied as standard equipment on Burnham Simplex Boiler orders. This should be kept in mind when applying conversion installations to the types of systems discussed.

Standard Equipment

Steam: Plain type T-11-A thermo, low water cut-off, pressuretrol, low limit aquastat for summer-winter domestic hot water, mixing or temperature control valve, domestic hot water relief valve.

Hot Water: Plain type T-11-A thermo, high limit aquastat, low limit aquastat for summer-winter domestic hot water, mixing or temperature control valve, domestic hot water relief valve, relay and aquastat to control circulator.

Where to Use

Without coil: All territories.

With instantaneous coil: Non-hard water territories in one family residences heated by steam or forced high temperature hot water systems when no more than 1 bath and 6 people or 2 baths and 5 people.

With slow recovery coil: All territories, except Woodhaven hard water district, in one or two family residences heated by Steam or Forced hot water system. Connection to tanks larger than 82 gallon size is not recommended. When sold in hard water districts write in on contract as follows: "Domestic Hot Water Coil is warranted for two years against failure in supply due to liming."

*Domestic Hot Water Operating Cost Estimates**
Daily Water Demand

	Consumption Per Month Summer (4 mos.)	Winter (8 mos.)
1 Family—50 Gallons per day (families of 3-5 people)	7500 cu. ft.	3000 cu. ft.
1 Family—75 Gallons per day (families of 6 people or more)	9000 cu. ft.	4500 cu. ft.
2 Family—All cases.	9000 cu. ft.	4500 cu. ft.

** For more detailed operating costs see following tables.*

AVERAGE HOT WATER CONSUMPTION AND COST
Computed on Residential Service Rate No. 1

Possible Water Heating Combinations	*Estimated Cooking Consumption—1800 cu. ft. a month* Summer 4 Months	Cost per Month—50 Gals. Hot Water a Day	*Estimated Refrigeration Consumption—1800 cu. ft. a month* Winter 8 Months	Cost per Month—50 Gals. Hot Water a Day	Avg./Mo. 12 Months
A. House Heating Boiler Coil used both Summer and Winter					
(a) With gas cooking	7500 cf	$5.22	3000 cf	$2.40	$3.34
(b) With gas cooking & refrigeration		4.63		2.04	2.90
B. House Heating Boiler Coil used Winter only Gas Water Heater used Summer only					
(a) With gas cooking	3800 cf	2.96	3000 cf	2.40	2.59
(b) With gas cooking & refrigeration		2.52		2.04	2.20
C. Gas Water Heater used both Summer and Winter					
(a) With gas cooking	3800 cf	2.96	3800 cf	2.96	2.96
(b) With gas cooking & refrigeration		2.52		2.52	2.52

	Cost per Month—75 Gals. Hot Water a Day* Summer 4 Months		Winter 8 Months		Avg./Mo. 12 Mos.
A. House Heating Boiler Coil used both Summer and Winter					
(a) With gas cooking	9000 cf	$6.04	4500 cf.	$3.42	$4.30
(b) With gas cooking & refrigeration		5.38		2.94	3.75
B. House Heating Boiler Coil used Winter only Gas Water Heater used Summer only					
(a) With gas cooking	5600 cf	4.08	4500 cf	3.42	3.64
(b) With gas cooking and refrigeration		3.60		2.94	3.16
C. Gas Water Heater used both Summer and Winter					
(a) With gas cooking	5600 cf.	4.08	5600 cf.	4.08	4.08
(b) With gas cooking and refrigeration		3.60		3.60	3.60

** May be used where hot water supplies two families and other gas utilization by the owner on the premises.*

BURNHAM SIMPLEX GAS DESIGNED BOILERS

Boiler Number	*Supplies Sq. Ft. Direct Rad. with no coil or with inst. coil*	*Supplies Sq. Ft. Direct Rad. with Slow recovery coil*
Steam Systems		
GS 32	250	184
GS 33	355	289
GS 34	500	434
Hot Water Systems		
WG 32	415	315
WG 33	575	475
WG 34	815	715

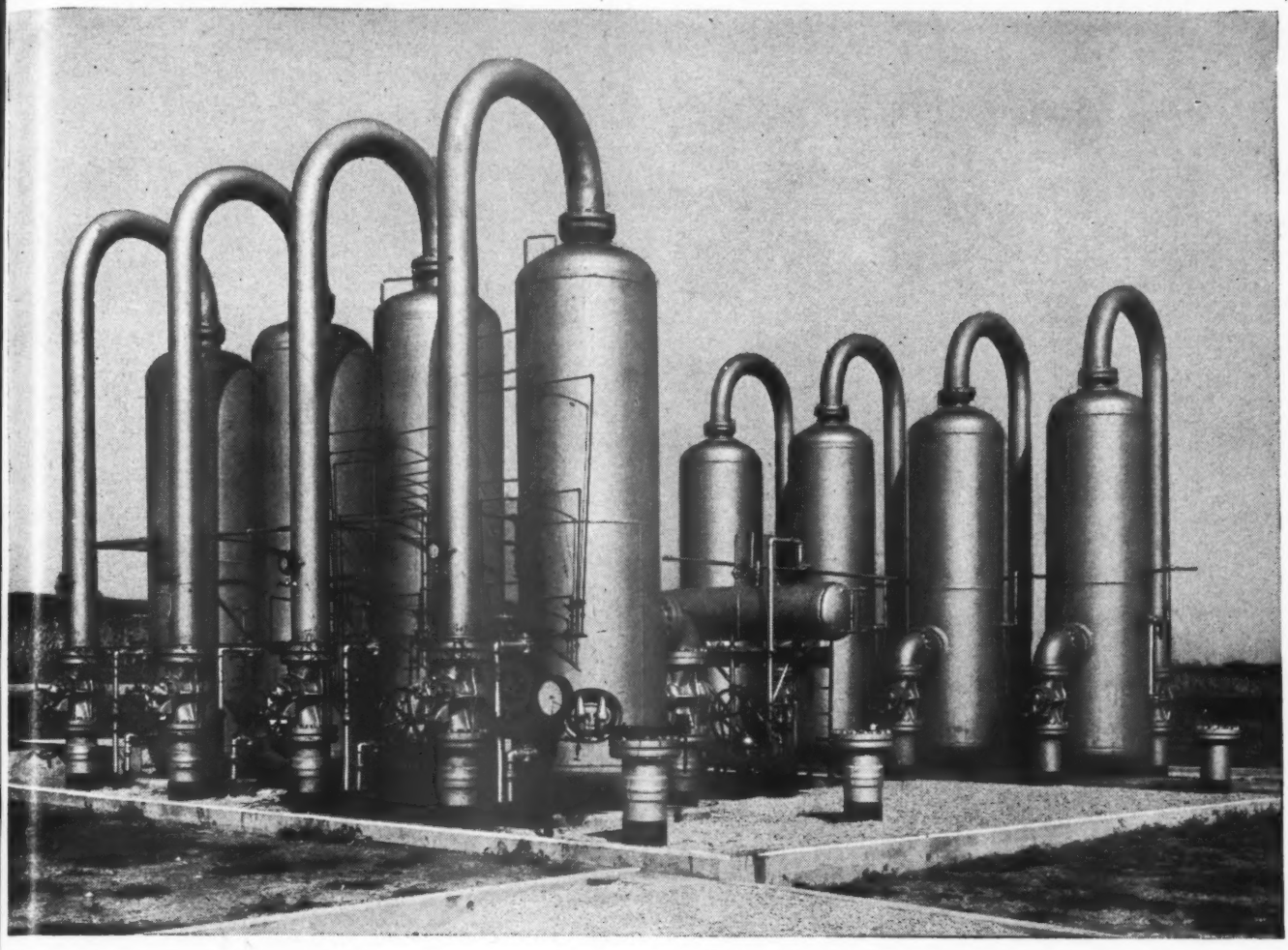
Comments on the Combined Service

In order to realize that others are equally convinced of the merits of this method of supplying hot water, I submit the following opinions.

Mr. P. B. R. Baas, Superintendent of the Customers' Service Division of The Brooklyn Gas Company says:

"Since the presentation of my paper there has been no further development of this equipment and the material contained therein may be considered up to date. Three years experience with about 300 of these installations have proved that our original conclusions were correct. High

(Continued on page 60)

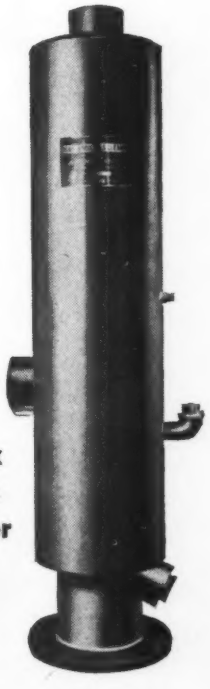


Clean Gas—at 300 Million or 300 Thousand Feet Per Day

Unconditioned gas is detrimental to both expensive equipment and customer good will. So to insure the delivery of clean, dry gas to their customers, progressive producers and distributors rely on Blaw-Knox for highly efficient conditioners in a wide range of capacities.

The installation shown above is handling over 300 million feet per day on a large mid-western line. Illustrated at the right is a low-cost Blaw-Knox "K" Series Gas Cleaner made in 2 sizes and 3 weights for service up to 800 lbs. pressure. Inexpensive and easy to install, they provide a final cleaning of the gas just ahead of the meters. Ideal for district regulator stations, town border stations or in front of a good customer's supply line. The K-6L will thoroughly condition 396,000 ft. per day at 30 lbs. pressure and costs only $95.00.

For complete data on Blaw-Knox Gas Conditioners write today for Bulletin 1869



Blaw-Knox "K" Series Gas Cleaner

$95

ARMY NAVY

6 plants of Blaw-Knox Company have been awarded the Army-Navy "E" for excellence

BLAW-KNOX GAS CLEANERS

BLAW-KNOX DIVISION OF BLAW-KNOX COMPANY • 2070 FARMERS BANK BLDG., PITTSBURGH, PA.

For Bricks that stand the gaff . . .
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FOR LININGS OF WATER GAS GENERATORS, **CRYSTOLON BRICK** give extremely long service—often for more than 22,000 hours of actual gas-making time without necessity for any major repairs. These silicon carbide brick are highly refractory, resistant to abrasion and resistant to the chemical action of molten slag and the penetration of molten ash. The clinker ring is easily barred loose from these dense brick, leaving the surface clean and unaffected for further service. **CRYSTOLON** linings usually pay for themselves in the first year by savings in cleaning costs alone.

NORTON COMPANY **Worcester 6, Mass.**

Norton Longer Lasting **Refractories**

Recent Evolutions In Process Heating With Gas

By
Harry W. Smith, Jr.
Manager, Technical Information Dept.
Selas Corporation of America

A REMARKABLE series of developments has occurred in the use of gas for metallurgical processing since 1940. The war has produced in the past 4 years more achievements with gas-air combustion than one can find in the whole history of industrial gas utilization since the inception of the low pressure inspirator and the development of the rotary gas carburizer.

To describe—or even name—all these recent and remarkable developments in the technique of using gas-air combustion for heat treatment is not our purpose in this brief report. *But perhaps we can decipher a trend or two, and attempt to fix a few "why's" underlying their "all-of-a-sudden" practicability.*

First, we see a whole new class of gas-fired heat treating equipment which in no way whatever resembles the traditional furnace. These new "freaks" of process heating (which many of us believe may some day be more numerous than furnaces) look like—and actually are — machine tools.

(1) Flow of work through them is continuous. (2) The entire work piece is seldom enclosed. (3) They occupy no more floor space than a shaper, or drill press, or turret lathe, or centerless grinder. (4) One piece is processed at a time, but an endless succession of pieces progresses through them *at the speed dictated by the forge or grinder they supply,* or *the saw or assembly bench from which they are fed.* (5) They are not segregated in an isolated "heat treat" department. (6) They are operated by women and "push button" operators whose function is never more than to load, unload, or inspect. (7) Their control is not by furnace pyrometry, but by part handling and time of exposure to specially adapted combustion elements. (8) They braze, they selectively harden, they locally anneal, they heat for forging, they solder, and they temper "on the run"—sometimes doing two or three of the above operations at once, or in timed sequence—and sometimes becoming part-and-parcel of equipment designed to perform other processing function not involving heat at all (like a press, a grinder, or a draw bench).

Second, we see higher-speed heating. We see cold billets 8″ square brought to forging temperatures (uniformly throughout within ±50°) in times like 32 minutes (as against a traditional 8 hours or 4 hours). We see 1″ solid bar stock in 20-foot lengths annealed through a "hell-hole" 13″ long by 5″ in diameter during continuous longitudinal translation at 2 feet per minute —the time under heat, therefore, being 30 seconds in lieu of the customary 2½ hours of soak in a traditional pan type furnace (a ratio in time of 300-to-1). We see 16 inches of 1″ wide cleat on a 26-pound cast grouser-link surface hardened to a depth of ¼″ in 55 seconds—we see a 24-inch diameter by 4-inch face herringbone gear weighing 175 lbs. flame hardened in 360 seconds—we see copper extrusion slugs, normally heated at 1550 for 51 minutes, raced in 90 seconds (34 times as fast) through a chamber at 2100°F. to be dead annealed with identical results, as checked under the metalograph, by Rockwell machine, and in the impact extrusion press.

Third, we see "pattern" or "selective" heating. No longer need the thin sections of (for example) a 100-lb. bomb or high-pressure gas bottle arrive at temperature within a few minutes after insertion in a furnace and wait at that temperature while the heavy sections at neck and base labor up to the heat during the better part of an hour. Combustion elements are "patterned" over the surface so that thin and light sections alike follow the same time-temperature curve, never differ in temperature during heating, and arrive at heat at the same instant. A complete envelope of dozens, or even hundreds, of independently adjustable heat sources (burners if you wish) can envelop the work at a distance of only 12 or 6 or even 2 inches from the surface, and can heat each patch of work surface so selectively that one can compensate for end losses or variations in mass throughout the work—and heat highly ribbed, bossed and configurated work (like one-piece tank hulls 25 feet long by 12½ tons heavy) with never a deviation from one point to any other of more than 10°F.

These are just 3 of many major trends in heat-treatment through gas-air combustion:

(1) Production-line "Machine-tools for Heat Treatment"

(2) Higher Heating Speeds

(3) "Pattern" or "Selective" heating

But they serve to make the point that the industrial process - combustion world "aint what it used to be" 'way back in the 30's when presidents only served two terms.

Now let us look for the basic technological differences in gas-air combustion which make such things possible. What are the new gas combustion techniques which have permitted the birth of the machine tool for heat treatment, the extra-speeds of modern gas heat, and patterned heat envelopes? They are simple. As we see it here they are:

(1) The use of higher thermal heads both in radiant and in convected heat transfer. Temperatures up to 3100°F. *over significant areas of the work-enclosing envelope* so that radiant heat transfer rates are greatly accelerated—and sometimes as much as 33% or 50% of the total solid angle about a part is "active" burner surface, not just intervening wall. Hot gas temperatures (yes, at the flue) which are alarming to "available heat" and "thermal-efficiency" calculators, but produce convection heating results we couldn't attain before we realized that real production efficiency is 90% time, labor, plant space, rejects, metallurgical results, etc., and only 10% Btu's and gas bills. (Parenthetically, let me note that any good production man can figure out a use for the so-called waste heat from high-thermal-head operations—for preheat of work, fuel or air, for space heating, for water heating).

(2) Building the total required combustion space into the burner itself—so that (a) no flame exists beyond the burner face, (b) the combustion reaction is completed before any influences beyond the burner can upset combustion chemistry and (c) the volume between the work and the work-enclosing envelope can be shrunk to a wee fraction former concepts (2 inches instead of 2 feet).

As a result: work-scrubbing hot gas speeds can multiply to rip off stagnant gas layers around the workpiece and whoop up surface conductances; total furnace bulks can shrink to permit more thorough insulation at sensible prices and cut radiation losses; and "hot spots" from those torches of still-reacting gases, which we call flames, cease to be a problem.

(3) Higher-pressures of gas-air mixtures (in accurate ratio) *at the burner*—not inches of water column (even 15 inches of water column), but pounds per square inch (2 lbs. or 3 lbs. or 5 lbs.). With premixtures of gas and air at pounds of pressure one can compact terrific heat releases into small combustion units—heat releases like 60,000,000 Btu per hour per cubic foot—15 times that reported and accepted in 1933 by the gas industry as "limit" with then available industrial gas equipment.

We have noted three trends: (1) machine-tools-for-heat-treatment, (2) high-speed heating, and (3) patterned or selective combustion. We have credited them to three techniques: (1) high thermal heads, (2) incorporation of all combustion space in the burner, and (3) high gas-air premixture pressures.

Now let it be said that the industry will have to forsake the use of metal burner constructions to employ these three techniques. Practical metals (even the heat enduring metals) won't take the protracted and localized heat of combustion required for high-thermal-head work—all combustion confined within the burner and compacted to the tune of 60,000,000 Btu per hr. per cubic foot. Metals scale, weaken, melt. Ceramics seem to be the answer. We predict that all-ceramic burner designs—now the war babies and special tools of process heating—will become the rule.

We believe that the most significant *basic* evolution in process heating with gaseous fuels is "ceramics in combustion."

Standardized Mechanical Joint for Gas

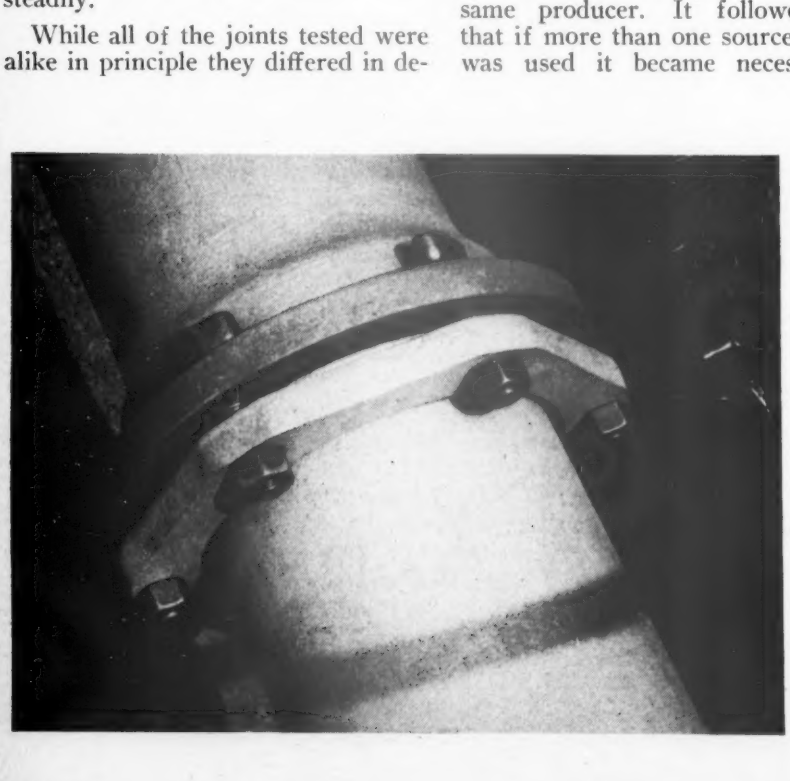
FOR a number of years the members of the Cast Iron Pipe Research Association have been producing Mechanical Joint Cast Iron Pipe for Gas Distribution. At the request of the producers of this pipe the American Gas Association Laboratories carried on extensive tests in 1931 for the purpose of determining the "tightness" of this joint under various pressures and with different degrees of deflection. The results of the tests indicated that all of the joints tested were suitable for gas distribution purposes. In the fourteen years that have elapsed since these tests were carried out experience has demonstrated the efficiency of these joints and the percentage of Mechanical Joint Cast Iron Pipe sold for gas purposes has increased steadily.

While all of the joints tested were alike in principle they differed in detail. They were all based on the stuffing box principle and consisted of a special bell provided with a flange cast integral with it—a Cast Iron gland—rubber gasket—bolts and nuts. All of the joints tested were found to be gas tight at pressures much higher than used in either gas transmission or distribution. Experience with the joint has proven that it can be easily installed and that it has more than enough flexibility necessary for pipe in underground service.

While all of the joints tested had the advantages referred to, they had the disadvantage of having parts that were not interchangeable. A gas company that bought pipe from one producer had of necessity to buy gaskets, bolts and glands from the same producer. It followed then that if more than one source of pipe was used it became necessary to stock joint accessories for pipe from each source of supply, thus complicating the matter of stocking pipe and joint parts. The possibility of pipe from one producer arriving on the job with accessories from another was always present, and on occasion serious annoyance resulted and in some cases construction was delayed.

Recognizing the demand for standardization in this field the members of the Cast Iron Pipe Research Association have developed a standardized joint with complete interchangeability of parts. Beginning in June, 1945 all members of the Cast Iron Pipe Research Association are prepared to furnish pipe and fittings in sizes from 3″ to 12″ equipped with the new Standardized Mechanical Joint. Glands, gaskets, bolts and nuts bought from any member of the Cast Iron Pipe Research Association can now be used with the pipe bought from any other member. There will no longer be any necessity of keeping several types of accessories in stock for each size of pipe, and the annoyance and delay that has occurred in the past due to the wrong parts getting on to a construction job will no longer occur.

Fittings, ordinarily used for gas construction, are also equipped with the standardized joint. Fittings will be all bell and will have the same laying lengths as standard flanged fittings. Pipe in sizes above 12″ equipped with the mechanical joints of the individual members is available as formerly.



Miami Beach Votes Against Purchase of Gas Plant

Miami Beach voters turned thumbs down on the proposed $2,650,000 purchase by the city of the Peoples Water and Gas Co. properties, by 1228 to 534. The purchase price agreed on was $2,000,000. The company supplies gas to communities in Broward and Dade counties.

Dealer Cooperation in the Gas Appliance Market

Prepared by the "Inter-Industry" Subcommittee of the American Gas Association

THE SUCCESSFUL sale of gas appliances is based on the same principles that govern the success or failure of selling in any line of business. Service to the public and the delivery to the ultimate purchaser of an item worth its cost are essential to success. Gas appliances have met these tests over a great many years. They have rendered a highly satisfactory service, have been remarkably trouble-free and have always appealed to the customer as a good value for the money spent. Up to this point they do not differ materially from hundreds of other commodities which normally account for a huge volume of retail business. From here on there is a marked difference for it must be remembered that gas service to the customer is no better than the equipment through which it is used. Thus, the installation of poor equipment, or equipment out of adjustment, adversely affects the gas company and the dealers who sell gas appliances. Only as present appliances render acceptable service and only as new and improved gas appliances are developed can the use of gas service by the public be expanded. The result is an unusual marketing condition where we find the gas company primarily interested in rendering satisfactory service and the sale of gas, which cannot be accomplished without good appliances, and the retail dealer interested in the profit resulting from the sale of appliances, the success of his efforts being dependent on the quality and cost of gas service available to his customers. Thus, we find two major operators in a single market whose interests are closely interdependent, although each one approaches the market with a different objective. Because of these conditions it is inevitable that seeming misunderstandings should arise from time to time, and yet, when calmly analyzed in the light of the facts, the inevitable decision is that the best interests of both parties are served when their mutual interdependence is recognized.

Let us examine for a moment the reasons back of this interdependence which exists in the face of seeming rivalry. Natural gas existed in this country when the colonists first landed, but its possible uses were neither known or understood; hence it had no value and could not have been sold at any price. Gas was made commercially available in Baltimore in 1816 and at that time every home was a prospect for gas service, but its use was new and untried and no buying rush was experienced. Over the years there have been continuous, aggressive marketing efforts on the part of the Gas Industry and in recent years many dealers have joined these efforts. The effect has been a better acceptance by the public of gas service from year to year and an ever broadening market for appliances. This result has been obtained only through constant effort and unfailing vigilance.

Gas appliances must be constantly improved to keep abreast of the public demand for greater comfort, convenience and efficiency in the home. There must not only be improvements to existing appliances but constant study and research looking to equipment that will permit the use of gas service in an increasing number of ways. It can be stated that the Gas Industry is now appropriating a greater sum for research and the development and promotion of gas appliances than has ever before been devoted to this work. As new appliances appear, they must be promoted by the gas utilities until customer acceptance can be built up. An illustration of a new type of application is year-round climate control for the home through gas air conditioning equipment which will be available shortly after the war.

Thus, there is promise of an ever widening market for gas appliances in the years ahead which can yield profitable business for dealers, but this result will not be fully achieved unless the Gas Industry continues to "lead" the market by popularizing improved and new uses and appliances

Careful studies have been made by the Gas Industry under the direction of its national post-war planning committee to learn, if possible, the most desirable and feasible ways of retaining and expanding its market, and naturally one of the important factors considered was encouragement of dealer distribution channels.

"Dealer cooperation" as often thought of in the past is qualified to take its place in the limbo of overworked words and phrases. Too often it has indicated the desire by one party to have the other party do all of the cooperating. Based on a careful study of its marketing problems and the discussion of these problems with representatives of various retail distribution channels, the American Gas Association, through action by its official board, has recommended to its member companies for their consideration a number of suggested sales policies which are believed to be of value in meeting many marketing problems that will arise in the post-war period.

An outline of these recommended sales policies and comments thereon are given below:

It is believed that gas utilities must undertake and continue full responsibility for leadership in gas appliance sales in their respective communities to the end that the inherent superiority of gas as a fuel shall be maintained: Accordingly the following recommendations are made:—

1. That national, regional and state gas associations should cooperate with all similar national organizations in all allied fields.

Since specific sales problems and the degree of interest in certain kinds

of equipment varies with geographic locations and since retail trade groups are usually quite effectively represented through their association, it will undoubtedly prove most effective to place the discussion of problems, which will arise on a national and state basis, through various trade associations.

2. That gas utilities should perform the task of promoting the sale of new and improved gas appliances to the point of assured customer acceptance.

Since gas appliances are vital to the use of gas service and the use can only be expanded through the development of new appliances, it is necessary that this type of work be carried on constantly. The introduction of a new appliance and a new service is often a slow and costly process. There is no question but what it is the obligation of the gas utility to carry appliances through this initial period.

3. That as customer acceptance materializes, the activities of the gas utility should be continued in such a manner as to maintain continuing acceptance of gas service and to increase the flow of gas appliance sales through normal channels of distribution.

The C P gas range is an outstanding example of an improvement upon an accepted gas appliance made necessary to meet the public demand for constant progress and development. This range provides greater profit for the dealer, more satisfaction for the customer and by replacing an old range which would not fully interpret the true value of gas service, removes the threat of competition in that home. When the C P range was first introduced, few, if any, dealers were interested in trying to sell them since no customer acceptance had been established. To a very large extent the gas utilities had to carry on the initial promotional work. Now, customer acceptance has been built up, and the dealer can participate in this very profitable market.

4. That the gas utility should assume responsibility for gas appliance sales training of personnel (utility and dealer alike), utilizing the coopperation of gas appliance manufacturers.

It is generally recognized that in the period after the war mass distribution of consumer goods will be necessary to support the mass production of which this country will be capable and upon which will rest our hopes for "full" employment. Authorities recognize the weakness of many prewar marketing methods, and adequate training of sales personnel will be a sensible and necessary approach to improved distribution efficiency.

5. That the gas utility should assume responsibility for training dealers in installation and service techniques, utilizing the cooperation of gas appliance manufacturers.

Trained installation and service personnel will be indispensable to the dealer to insure satisfactory operation of modern automatic appliances and to the utility to make sure the customer receives the great benefits that gas as a fuel can offer.

6. That the gas utility should keep dealers informed as to the increased merchandising opportunities offered to them in the gas appliance field, e.g., additional lines, new products, new rates, etc.

Market studies, to determine facts about appliance saturations, customer preferences and possible markets for new products will be of value in deciding lines to be handled and effective sales campaigns. The gas utility will best be able to furnish such information to retail distribution outlets.

7. That the gas utility should inform all concerned with home construction and financing on all matters having to do with gas equipment and gas service.

It is generally conceded that there will be a new home building boom of considerable proportions in the postwar period. How soon it starts and how rapidly its momentum increases are not as important as the kind of home to be built and that the extent of the need for gas service be fully understood.

8. That the gas utility should provide or make available to dealers facilities for financing gas appliance installment sales as attractive and advantageous as the utility's own.

Deferred payment financing of household appliances was sound in the past and will be resumed when consumer goods are again available. The exact terms are not as important as it is that dealers be in a position to offer gas appliances on competitive terms. A committee of the American Gas Association is actively studying this problem. One report has been issued and others will follow as further studies are completed.

9. That the gas utility should initiate and promote appliance sales campaigns with cooperating gas appliance dealers.

Prior to the war, enough examples existed of national and even state wide coordinated appliance campaigns to indicate the value of this method of marketing.

10. That home service and all other aids maintained by the gas utility should be made available to cooperating gas appliance dealers.

The assistance rendered housewives by Home Service Departments during the war on problems of nutrition, food conservation, appliance care, etc., has elicited customer praise. The continuation of favorable customer contacts will be important in the highly competitive post-war era. Making such service available in cooperation with dealers will be a powerful sales tool, but no amount of customer contact will overcome the handicap of poorly designed or poor quality merchandise.

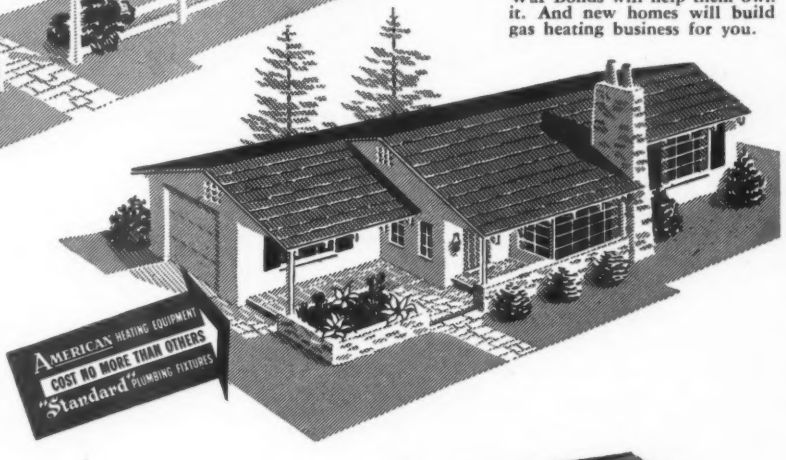
11. That the gas utility should provide full information as to its policies and practices so as to establish a relationship of mutual understanding and confidence with the dealers.

A complete understanding of the market possibilities and the mutual interest of manufacturers, dealers and gas utilities will only be fully arrived at as the result of close, constant contact by the parties at interest. Frank discussions of various problems as they arise will yield the best results and prevent misdirected effort and expense. It is believed that a majority of all gas companies will endorse these policies, and that adherence to them will do much to remove misunderstandings that may have existed in the past between dealers and gas utilities. Leaders of both groups now realize that their interests are closely related and that a cooperative effort will produce the best results for all concerned, including the buying public.

TODAY'S NEST EGGS...

will mean more gas heated homes tomorrow!

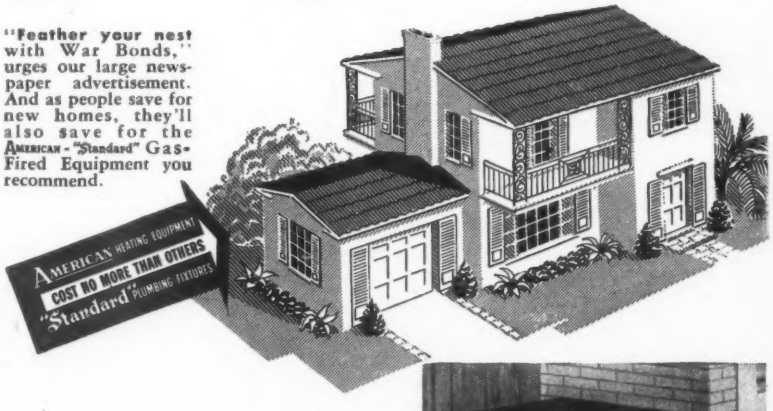
Featured this month in a national newspaper campaign, this charming New England home is selling plenty of War Bonds for Uncle Sam, building future business for you.



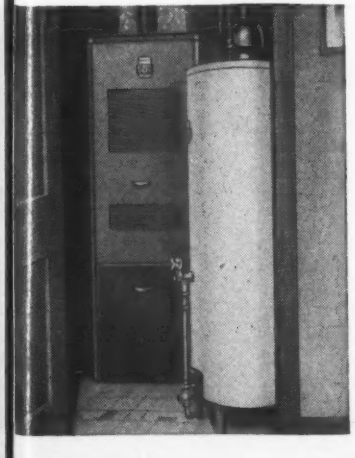
"Want this ranch house?" asks the AMERICAN-"Standard" newspaper advertisement of millions of Americans. They are told that War Bonds will help them own it. And new homes will build gas heating business for you.

THIS MONTH 1061 newspapers, with a circulation of approximately 29,000,000, are featuring the AMERICAN-"Standard" advertisement showing these model homes and urging the purchase of War Bonds as a first step toward ownership. New Homes mean new gas heating equipment—and increased gas load. They mean profitable business for you.

During the war years, in homes throughout the nation, the dependable, economical performance of AMERICAN Gas Boilers, SUNBEAM Warm Air Furnaces and Winter Air Conditioners, and AMERICAN Gas Fired Water Heaters has won thousands of friends. When full production is resumed, homebuilders will be waiting to "follow the arrow" to your door.

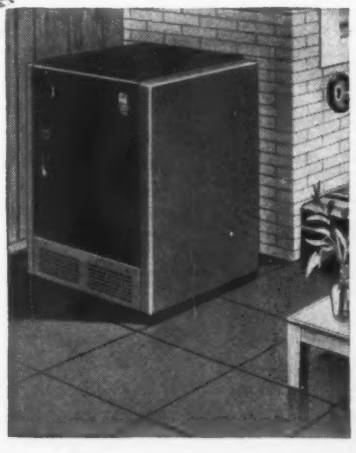


"Feather your nest with War Bonds," urges our large newspaper advertisement. And as people save for new homes, they'll also save for the AMERICAN-"Standard" Gas-Fired Equipment you recommend.



(Left) **Illustration shows** actual installation of a **SUNBEAM** Gas Fired Winter Air Conditioner and Budget Storage Water Heater in a utility closet of a small home. Also adapted for individual apartments, stores and similar space.

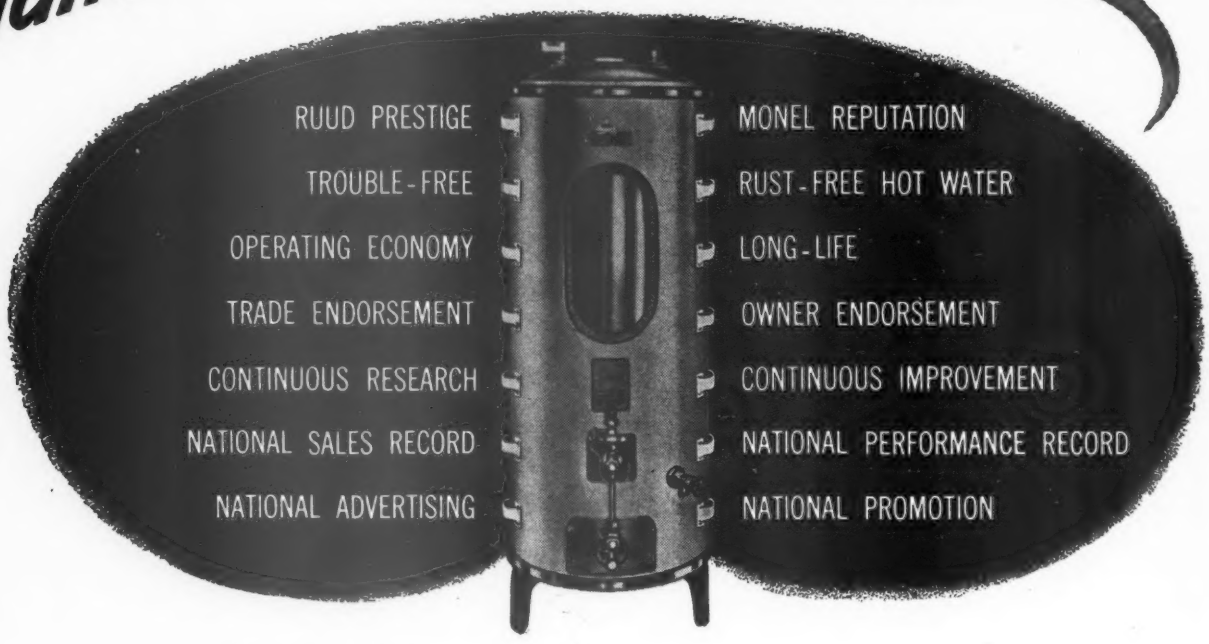
(Right) **The Empire Ideal Gas Boiler** will be first choice for the recreation room of that wonderful new home that many thrifty War Bond buyers are looking forward to owning after the war.



AMERICAN RADIATOR & Standard Sanitary

New York **CORPORATION** *Pittsburgh*

Handles... that help you HOLD THE LOAD!



H_2OT STUFF

★ **If you were selling** water heaters in Iceland, you'd compete with volcanic springs which furnish 24-hour-a-day hot water service rivaling that supplied by Ruud-Monel.

2700 homes in Reykjavik, for example, are connected by insulated pipeline with wells 10 miles away. Hot water comes out of the ground at 170° F., and reaches the homes with only a nine-degree heat loss.

★ **The first-prize winner** in a contest sponsored by the Michigan Consolidated Gas Company (Grand Rapids) named 870 different uses for hot water.

As she accepted her Ruud Automatic Gas Water Heater prize, she modestly remarked, "I could add even more."

★ **According to the 1940 Census,** 56.2% of all homes in the United States have either a bathtub or a shower.

★ **One customer** can still get Monel tanks—the U. S. Navy.

Used to hold distilled water for submarine storage batteries, Monel tanks assure high purity... and absolute freedom from rust.

A water heater with *handles?*

Yes... because handles help you *sell.*

And because they keep customers *sold.*

Ruud Automatic Gas Water Heaters with Monel Tanks always had *strong* handles. Before the war, the Ruud-Monel combination was solidly established... had been enthusiastically accepted by utility, dealer and customer.

When battle clouds roll away, Ruud Automatic Gas Water Heaters—with tanks of rustfree, corrosion-resistant Monel—will be back. And, as a result of tireless research carried on by Ruud in cooperation with The International Nickel Company, you'll find improvements in appearance, construction and operation.

WE PREDICT: Ruud-Monel Water Heaters will play an important role in helping *GAS,* the Wonder Flame, win... *and hold*... a tremendous peacetime load.

Your customers will have an abundance of crystal-clear hot water... 24 hours a day... at any desired temperature. That's the kind of service they *expect*... and the kind you *want* them to have.

RUUD MANUFACTURING COMPANY, PITTSBURGH 1, PA.

RUUD GAS MONEL ... perfect partners for *Automatic Hot Water Service*

Utility Executives Discuss Post-War Appliances and Equipment with Architects and Constructors

SOUTHERN CALIFORNIA Gas Co. and Southern Counties Gas Co. served as joint hosts at an informational meeting tendered officers and members of the Producers Council of Southern California and the Southern California Chapter of the American Institute of Architects held in the auditorium of the gas companies' building, Los Angeles, on the night of April 24.

The dinner session was the first of a series of meetings to be sponsored by the gas utilities on developments of gas appliances and equipment for postwar homes, at which members of other industry associations connected with the design, construction or equipping of postwar homes are to be the guests of the utility companies.

John L. Hall, general supervisor, residential gas sales, Southern California Gas Co. served as chairman. After outlining the purposes of the meeting, Mr. Hall introduced officers of the local architects association, the Producers Council, the Structural Engineers Association, and officers and executives of Southern California and Southern Counties Gas Co.

Gas in the Post-War Home

The first speaker was W. M. Jacobs, manager, general sales, Southern California Gas Co. Speaking on the subject, "Gas in the Postwar Home," Mr. Jacobs gave an outline, illustrated with slides on modern kitchens and things to come after the war. He mentioned a new type of hydraulic dishwasher without motors or pumps, and improved home laundry equipment with which a complete washing job can be accomplished with but little more effort than setting of a few dials. He emphasized the point that important changes in the field of domestic gas appliances will be evolutionary, not revolutionary.

"Our appliance manufacturers have done a marvelous job of producing war goods," Mr. Jacobs told the group of 200 architects and gas industry executives at the meeting. "While many of you may think that the war does not appreciably touch a gas company, we too have been doing a war job, and it has not been without its problems.

"We have had to satisfy unprecedented demands for service. A population increase of something like 25% has added 60,000 units of defense housing, plus a heavy bulge in the use of gas per customer. Increases in demands for industrial gas also have been spectacular, and have resulted in heavy increases to our firm load. One of our peak load days this winter we supplied some 628 million cubic feet of gas. Visualizing its equivalent, we come to 5,275,000 gallons of oil or 480 railroad tank cars; or 31,400 tons of coal, or about 400 railroad cars; or about 210 million kilowatt hours of electric energy, or the full and steady output of almost nine Boulder Dams."

Concerning the outlook for the future and the postwar period, Mr. Jacobs said:

"Gas industry research, both within the American Gas Association and at the manufacturer level, has been most active on appliance development. From this many further improvements in gas appliances will be born. There will be new burner designs and methods of heat transfer; new methods of ignition. There will be improvements in the already highly perfected baking and broiling performance of gas ranges. There will be new types of materials used. Beauty, cleanliness and convenience will be enhanced by new production techniques which will give smoother surfaces, rounded corners and fewer cracks and seams. There will be more streamlined appearance, cove bases, cleanliness of line."

Some of the gas industry executives and members of building and architectural societies who attended a dinner meeting.

Left to right: R. W. Derrah, president, Southern California Chapter, American Institute of Architects, who designed the gas companies' building; W. M. Jacobs, manager general sales, and John L. Hall, general sales supervisor of residential gas for Southern California Gas Co.; Kenneth Wing, vice president, Southern California Chapter, A.I.A.; J. K. Knighton, manager, air conditioning division, Servel, Inc., Evansville, Ind.; and H. L. Masser, executive vice-president, Southern California Gas Co.

Commenting on forthcoming new types of appliances to add to the housewife's convenience after the war, he explained that a new hydraulic type automatic dishwasher, having no motors or pumps, is expected to be manufactured on a scale which will bring its price down to levels permitting wide acceptance.

"There will also be a new, compact, automatic gas laundry dryer, a companion to the automatic cycle type washing machine. With this combination, the complete laundering job will involve little more than setting the dials, and the clothesline and service yard can be banished. There will undoubtedly be a companion type of gas refrigerator for incorporation into the streamlined packaged gas kitchen. And there is the spectacular new development of the Servel all-year gas air conditioning for both residences and commercial establishments."

Mr. Jacobs accented the fact that major appliance changes will not make their appearance immediately. The first postwar appliances, will essentially be the 1941 models, with a few improvements. The more important changes in gas appliances probably will not come until from one to three years after the end of the war, and will be evolutionary in nature, rather than revolutionary, without any bizarre or eccentric features.

"The appliances due to come after the war," Mr. Jacobs said, "will incorporate functional perfection, but change will not be made for the sake of change alone. They will be like one of our own gas company advertising slogans: "Modern, But Practical Too."

The second speaker was J. K. Knighton, manager, air conditioning division, Servel, Inc., Evansville, Ind., whose subject was "A New Quality of Living."

Knighton on Air Conditioning

Mr. Knighton, a nationally recognized authority on air conditioning equipment and its application, described the new Servel all-year, gas-operated air conditioning unit. This unit, which has been in course of development for the past seven years, with 300 installations made and in operation before the war halted manufacture, provides the six major points required in the proper conditioning of air—efficient heating, effective cooling, controlled humidification, positive dehumidification, selective air circulation and thorough air cleaning.

He laid emphasis on the growing volume of business due in the postwar period in the field of home air conditioning. He expressed the opinion that 70% of those planning to buy or build postwar homes want all-year air conditioning.

"A lesser number, perhaps 50%, have a desire for it, which is the next thing to wanting it. We know through expressed interest that a still smaller percentage have a very definite demand that will utilize gas air conditioning to capacity during the first year of production in the postwar period."

Mr. Knighton declared that the percentages he cited have been authenticated by the inquiries that had come to the company, and his belief that the demand for air conditioning in homes and small industrial plants after the war will be far greater than the industry will be able to supply during the first 12 to 18 months after the end of the war.

"The popular concept of air conditioning is confined largely to the experiences obtained through direct contact through comfort cooling in such commercial spaces as theaters, stores, railroad trains, etc. This experience has created a desire for similar comfort in the home. Complete all-year air conditioning in the home provides comfort 365 days in the year regardless of outdoor conditions. This type of comfort can well be called a new quality of living. This applies to all space, all members of the family, every hour of the day, every hour of the year.

"From the space point of view, the working space or kitchen becomes a comfortable place for the preparation of foods, as well as the rather arduous task of cleaning up. In the dining space, this new quality of living means better appetite, happy dispositions, comfort and complete relaxation, and pride of possession takes on a far more important meaning."

Addressing himself specifically to the assembled architects as representatives of a profession intimately connected with the design of postwar homes, Mr. Knighton outlined new concepts of home construction that have been brought on by the public's wider acceptance of home air conditioning.

As an example of how new developments bring changes in accepted standards and practices in their wake, he cited the development of the automobile and how the garage has advanced from a shed, built as an afterthought, some distance from the home, to a built-in, integral part of the modern home.

"When automobiles first came in," he said, "a garage for the family car had to be added. Garages were not part of the home in the first decade of this century, nor in the second decade. Gradually, however, as the automobile became an indispensable part of the American way of life, architects and home designers had necessarily to revise their ideas of home design by including garages in the general layout."

Mr. Knighton cited various ways in which the increased use of air conditioning in homes will affect the

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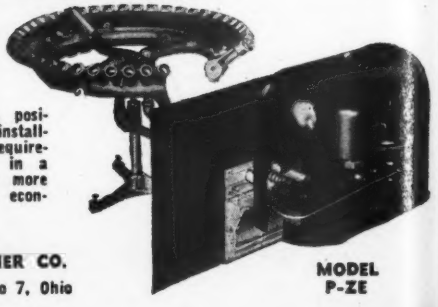

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MODEL P-ZE

work of the architect who must plan the homes. He mentioned also ways in which the cost of air conditioning installations can be compensated by the elimination of parts or sections of homes which will no longer be required when homes are equipped with all-year air conditioning.

"Porches, for instance,—For decades a good-sized, roomy-porch was regarded as a necessity in many homes. It served, virtually, as an auxiliary living room in summer when the rooms in the house were too hot for comfortable occupancy.

"A postwar home with all-year air conditioning will not need a porch to assure comfort to its owners. The living room can be made as comfortable as desired in summer. There is one point where the architect can offset part of the cost of air conditioning—by eliminating the expense of the porch."

Concerning windows, as designed for homes without air conditioning, Mr. Knighton questioned the practical need for the upper half of windows as now included in homes.

"What good is the upper half of a double window?" he asked. "You have to stand on a stepladder to look through it, so from the visibility standpoint it is useless. Ventilating? It seems to be the general practice to raise the lower half for ventilation. The upper half of windows could well be eliminated in homes equipped with all-year air conditioning, thereby effecting another saving in the general construction cost."

Mr. Knighton cautioned the architects not to regard air conditioning as an "extra" in the home, but as an integral, essential part of postwar residential design.

"Air conditioning," he said in conclusion, "has opened up to the architect avenues that were closed to them in the past. As to cost of air conditioning for the home, that is still hard to discuss definitely. But you can lower the overall cost if you deviate from tradition in your profession, by giving thought to the fact that you are in position to provide your clients with controlled air conditions in their homes and eliminating cost factors that are superfluous in an air conditioned house."

Seated at the head table, and introduced by Chairman Hall, were the following:

R. W. Derrah, president, Southern California Chapter, American Institute of Architects, whom Mr. Hall introduced as the architect who designed the new gas company building in which the meeting was being held; Kenneth Wing, vice-president; George Gable, director; and Walter Hagedohn, past president of the Southern California Chapter; Henry Eggers, secretary, California State Chapter, A.M.I., and Capt. E. Allan Sheet, a state director; Warren Hoyt, president, Walter Steyer, secretary, and Paul Keenan, vice-president, Producers Council.

Approved Requirements for Appliances Used at High Altitudes

Special high altitude approval requirements for gas appliances designated for use at altitudes above 2,000 feet have been adopted by the Approval Requirements Committee, a sectional committee, of the American Standards Association. The new requirements became effective immediately following their adoption April 13 and are expected to be accepted by the American Standards Association in the near future as American Standard.

The American Gas Association Testing Laboratories are prepared to test ranges, space heaters, central heating appliances, and water heaters under the new requirements immediately, these being the classes of appliances affected by the action. All other types are expected to be covered later. High altitude requirements for hotel and restaurant equipment are in preparation at the present time.

Generally speaking the new requirements cover gas equipment operating on all gases including liquefied petroleum and butane-air. Specific tests are provided for combustion as well as for performance of main and pilot burners and draft hoods. High altitude is defined as any elevation between 2,000 and 5,200 feet.

Appliances approved for high altitude use will bear additional markings indicating such use together with their high altitude input rating for all burners except those for which minimum ratings are specified. Tests for high altitude approval will be conducted at low altitude on natural gas with main and pilot burners adjusted at normal test pressure at 26 per cent above the manufacturer's specified high altitude gas input rating. Where constructional changes are made for use at high altitude over that at low altitude, such additional tests as these changes may necessitate will be conducted.

This test procedure is equivalent to testing at 5,200 feet elevation above sea level at the rating specified. It was adopted after exhaustive experimentation with both this test method and one employing a special chamber at the National Bureau of Standards in which any desired altitude condition could be duplicated. The special chamber method was considered impractical because it would be more expensive and time-consuming and furthermore would be impractical and inconvenient for manufacturers to employ for development purposes. On the other hand the method adopted could easily be employed by manufacturers in their own testing operations.

The new requirements will benefit approximately 1,200,000 people in the Rocky Mountain area, the majority of cities in this area being located at elevations of from 3,000 to 8,000 feet. For altitudes above 5,000 feet the approved high altitude input rating should be reduced by 5 per cent for each 1,000 foot increase in elevation.

St. Louis Meets Flood Emergency With Stand-by Equipment

Flood waters about 80 miles south of the city caused a break in the natural gas pipeline supplying St. Louis and environs, near midnight, April 13. All industrial plants using straight natural gas were without service for 87 hours.

Residential, commercial and some industrial plants, served with mixed gas were supplied by the manufacturing plants of the Laclede Gas Light Company. When the outage occurred, the Laclede immediately placed in operation four water gas sets, held in readiness as stand-by equipment and began enriching the coke oven gas produced in Carondelet with butane storage. The outage was prolonged when partial repairs to the line were swept away by a second onrush of waters, which made it necessary to make appeals for the conservation of gas, through the news columns of the three metropolitan papers and during news broadcasts of radio stations. Cooperation on the part of the residential customers is believed to have helped materially in keeping down the sendout on Monday morning, April 16.

In addition to the extra production from the water gas sets, and the supply of butane normally kept on hand, the company used 126,000 gallons of butane and propane shipped from the Phillips Petroleum and Shell Oil Company refineries at Wood River and East St. Louis, Illinois.

Performance . . .

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- Low Pressure Service or Appliance Regulators
- District Station Regulators, Single or Double Valve, Auxiliary Bowl and Automatic Loading Device Optional
- High Pressure Line Regulators Pilot Loaded—Pilot Controlled
- Toggle Type Regulators. Single Valve, Double Valve, Triple Outlet
- Seals: Dead Weight or Mercury
- Relief Valves: High or Low Pressure
- Back Pressure Valves. Automatic Quick-Closing Anti-Vacuum Valves
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GAS CONTROL SINCE 1892

Gas Transmission Line Rates as Influenced by The New Rate-Making Method

By
John Simpson

THE PANHANDLE EASTERN Pipe Line Company owns properties constituting a natural gas production, transportation and marketing system extending from gas fields in Texas, Oklahoma and Kansas through Missouri, Illinois, Indiana and Ohio and into Michigan. It is the longest gas pipe line in the world, serving more than 200 cities, towns and communities with more than 700,000 retail customers in Texas, Kansas, Illinois, Indiana, Michigan and Ohio. Following a complaint alleging that the company's rates to a distributing company for resale in Detroit and vicinity were unjust and unreasonable, the Federal Power Commission instituted an investigation of all the interstate wholesale rates of the Panhandle Eastern. It required the company to reduce these rates from November 1, 1942, so as to reflect, when applied to the 1941 transportation and sales, a reduction of not less than $5,094,384 per annum below the 1941 consolidated gross operating revenues of $17,789,573. That order was affirmed by the Eighth Circuit Court of Appeals, one judge dissenting in part. (143 F2d 488). The case was taken to the United States Supreme Court on writ of certiorari which was granted, but review was limited to two questions.

Segregation of Business

One of the points reviewed was the segregation of the regulated and unregulated business of the company. The Commission had made no segregation or separation of the company's properties used in direct industrial sales and those used in sales made to distributing companies for resale. And it did not make an allocation of costs between regulated and unregulated phases of the business as it did in other similar rate cases being decided at the same time. The commission considered such an allocation unnecessary in the circumstances, because less than a sixth of one per cent of its entire investment in plant is used exclusively in the service of the direct industrials, and the company's president conceded that any attempt to allocate would be theoretical and not practical because of the unified character of the business. The Commission found that the incidental direct industrial business was in reality a by-product of the wholesale business. The Panhandle Eastern opposed this finding on review.

The Panhandle Eastern contended that such an allocation should have been made of the property or the costs between the regulated and unregulated business because the direct sales were beyond the jurisdiction of the Commission, even though they were comparatively small.

The Supreme Court agrees that the Commission must make a separation of the regulated and unregulated business when it fixes the interstate rates of a company whose activities embrace both. The question here was whether a formal allocation was necessary under the exceptional circumstances of the case. The dispute here was not about the principle of allocation but as to the propriety of the procedure followed here.

The Commission allocated to the interstate wholesale business all the earnings from the entire business in excess of 6½ per cent return, as being justified by the use which the direct industrial business made of the main transmission line and its facilities. If that was fair, the Supreme Court says, no reversible error was shown.

The company had never requested the Commission to make a segregation of the properties used in the two classes of business. The Commission's failure to make a segregation of the property could not therefore be attacked in the Supreme Court. All agreed that a fair division of the apparent profit from the direct industrial business had to be made and that was a matter of judgment and mathematics. These considerations and the company's failure to insist on a segregation of property and its own failure to keep accounts which reflected a segregation or allocation, constrained the Supreme Court to hold that the Commission did not err in forsaking a formula and using its informal judgment instead.

The rate base found by the Commission was $67,137,305, on which it allowed a return of 6½ per cent as "fair and liberal."

The Hope Company Case

The Supreme Court concluded its opinion by pointing out that the Hope Company case holds that "the Commission is not bound to use any single formula for the fixing of rates. It is not precluded from using actual legitimate cost as it did here. The question on review is not the method of valuation which was used but the end result obtained, since the issue is whether the rate fixed is 'just and reasonable.' In the present case the 6½ per cent return allowed by the Commission will permit petitioner to earn $4,363,925 annually on the basis of the test year after meeting all operating expenses, which include depreciation, exploratory and development costs, and federal income taxes. The cost of servicing petitioner's long term debt is $957,786 or 2.88 per cent. The cost of meeting the requirements of the preferred stock is $939,000 or 5.8 per cent. That leaves $2,467,139 for $20,184,175 of common stock—a return of 12 per cent. The return would be 9 per cent figured on the basis of common stock and surplus of $27,650,000. We are unable to say on these undisputed facts that the return is not commensurate with the risk, that confidence in petitioner's financial integrity has been impaired, or that petitioner's ability to attract capital, to maintain its credit, and to operate successfully and efficiently, has been impeded." See Hope case 320 U.S. 591,603. The Circuit Court of Appeals judgment affirming the Commission's order was therefore in turn affirmed.

In this decision Chief Justice Stone and Justices Roberts, Reed and Frankfurter concurred for the following reasons only: The company and its subsidiaries as petitioners did not raise objection in their application for rehearing of the case to the inclusion of their producing and gathering facilities in the rate base as required by Sec. 19 (b)

of the Natural Gas Act, and no reason appeared for their failure to do so. The opinion was delivered by Justice Douglas.

After the proceedings were instituted, Illinois Natural Gas Company and Michigan Gas Transmission Corporation, then wholly owned subsidiaries of Panhandle Eastern, sold all their properties to the parent company, leaving Panhandle Eastern the only petitioner before the Supreme Court.

The Circuit Court, in concluding its opinion, stated succinctly and clearly its understanding of the method approved by the Supreme Court in the Hope Case to be followed by the Federal Power Commission in fixing the Circuit Court's powers in reviewing the order of the Commission. The Commission is not bound to use any single formula in fixing rates for natural gas, and in view of that fact the rejection of reproduction cost or of market or replacement values by the Commission in fixing such rates did not amount to a denial of due process of law to the gas companies so as to require a remand of the proceedings to the Commission. And in reviewing the Commission's order, the Circuit Court of Appeals could assume that the proferred evidence, rejected by the Commission, would, if admitted, have proved all that the gas companies claimed for it, namely, that the reproduction cost of their property, less observed depreciation, on June 30, 1941, was $83,957,083.

In ruling upon the question whether the return allowed by the Commission had been shown to be unjust unreasonable, or confiscatory, the Circuit Court of Appeals gave in detail its construction of what its powers as a reviewing court are in such cases, as laid down by the Supreme Court in the Hope Case. That case indicated to the Circuit Court that, aside from questions relating to procedural due process and jurisdiction, a reviewing court may interest itself only in the effect of the Commission's order. It cannot concern itself with the Commission's choice of formulae or the propriety of the methods employed by it in reaching its conclusion, but only with the consequences of the order made. If the effect of the order is to deny to the utility a return sufficient reasonably to meet its necessities and to enable it to continue to render adequate public service, the order is arbitrary or confiscatory and may be set aside.

The Circuit Court considered it apparent that the Supreme Court is presently of the opinion that, within broad limits, the Commission should be freed from judicial interference in regulating rates of natural gas companies, and holds it evidently is no longer necessary for a reviewing court to consider many of the doubtful and debatable questions which ordinarily arise in every rate case.

Questions Raised by Court

Among these questions the court enumerated the following: (1) whether replacement of reproduction cost less observed depreciation, or prudent investment, or historical cost, should be used as a rate base; (2) whether proper allocation of revenues which are subject to regulation and revenues which are not subject to regulation has been made by the Commission; (3) whether the cost or value of items of property which, for reasons deemed sufficient by the Commission, have been excluded by it from the rate base, should have been included; (4) whether the Commission has given due consideration to every pertinent fact; and (5) whether the reasoning of the Commission which underlies its final determination is sound or unsound.

This conclusion as to its powers and duties in this particular matter the Circuit Court based expressly on the passage in the Hope Case opinion, 320 U.S. 591, at pages 602-603, beginning: "We held in Federal Power Commission V. Natural Gas Pipeline Co., (315 U.S. 575) that the Commission was not bound to the use of any single formula or combination of formulas in determining rates. Its rate-making function, moreover, involves the making of 'pragmatic adjustments.' (315 U.S. 586)."

The Circuit Court also quoted page 605 of the Hope Case to the following effect: "XXX Rates which enable the company to operate successfully, to maintain its financial integrity, to attract capital, and to compensate its investors for the risks assumed certainly cannot be condemned as invalid, even though they might produce only a meager return on the so-called 'fair value' rate base."

The Court's Conclusion

Its general conclusion, based on these considerations, was: "The order of the Commission must be affirmed unless the petitioners have made a convincing showing that it is unreasonable in its consequences because the return allowed is insufficient to enable them to meet their expenses of operation, to pay interest on their bonds and dividends on their stock, to maintain their credit, and to attract capital, or is clearly out of line with the return on investments in enterprises involving comparable risks."

A rate of return permitting the Panhandle Eastern and its wholly owned subsidiaries to earn a return of $4,363,925 annually, equal to 6½ per cent of the amount found to represent the present value of the properties of all the companies, was held to be supported by substantial evidence.

The court directed attention to the fact that the Commission's order was not final and irrevocable, but was to be regarded, on review, as a preliminary one, made to cover a reasonable test period and subject to change by the Commission if experience proves that the rates fixed are either too low or too high.

Other Cases

On the same day the Supreme Court decided three other cases of which two, Colorado Interstate Gas Company v. Federal Power Commission, City and County of Denver, et al., and Canadian River Gas Company v. Federal Power Commission et al. were on writ of certiorari from the Tenth Circuit Court of Appeals. The Tenth Circuit affirmed the Commission's order (142 F2d 943) and the Supreme Court affirmed the Tenth Circuit's judgments in both cases. Justice Jackson wrote a concurring opinion. Chief Justice Stone dissented in the Canadian River case only, with an opinion.

Justice Roberts and Justice Reed dissented from so much of the opinion as approves the allocation by the Commission of investments and expenses to the non-regulable transmission properties. They also concurred in Chief Justice Stone's dissent in the Canadian River case.

The Commission's rate reduction orders in these cases were, it was held by the Supreme Court, not invalid because the Commission did not segregate or allocate property of the two companies, parent and subsidiary, used in common in making intrastate and interstate sales. The "demand and commodity" method of allocating costs does not plainly contravene the Natural Gas Act. All gas sold by a producing company to a distributing company for resale,

(Continued on page 60)

Test Procedure for Determining Hydrogen Sulphide and Mercaptan Content of Natural Gas

THE METHOD devised by The Railroad Commission of Texas for determining the hydrogen sulfide and mercaptan content of a natural gas consists of absorbing these gases in certain chemical solutions, titrating the solutions for the amount of sulfur present, and finally making the required calculations.

Since natural gas may contain mercaptans in varying amounts, it became necessary to devise some method of determination that would embrace the following factors:

(1) The selection of a chemical solution which would completely absorb all of the hydrogen sulfide in the natural gas and allow the mercaptans to pass on.

(2) The use of an absorbent which would catch the above separated mercaptans.

(3) Complete absorption of these gases by use of properly designed scrubbing bottles.

To fulfill the above requirements, slightly acidified cadmium sulfate solution is used to absorb the hydrogen sulfide because of the high solubility of the cadmium sulfide formed. Since the mercaptans also have weak acidic properties, the hydrogen in concentration of the cadmium sulfate solution is slightly raised by the addition of the acid.

A .025 N solution of silver nitrate was found very successful in absorbing the mercaptan gas passing over from the scrubber bottle.

The two most important factors to insure complete absorption are the length of passage in which liquid and gas are in contact and the size of the gas bubbles dispersed within the liquid. The absorber used is of the Schott type with a Jena-fritted-glass disk extending down the inside of the bottle. The approximate pore diameters are from 100 to 120 microns, giving a fine dispersion of gas. It has been found that a very simple type of absorber can be made from a 1" x 8" test tube fitted with a two-hole rubber stopper, through which passes a glass inlet tube extending almost to the bottom of the test tube.

A set of two absorbers, connected by a short piece of sulfur-free rubber hose, is used in this procedure. Into the first absorber, 40 cc. of .5 N Cadmium Sulfate solution and 3 cc. of .1 N sulphuric acid are introduced by means of a pipette. The second absorber contains 40 cc. of .025 N silver nitrate solution. These two absorbers are connected by a short piece of sulfur free rubber tubing, while the gas outlet of the second absorber is connected to a dry-test meter.

It is important that the gas procured be a representative sample. If gas is allowed to remain in the well for a period of time, it may be stripped of part of its hydrogen sulfide due to the action of the gas upon the steel tubing. Also, without any circulation of the gas in the well, the hydrogen sulfide and mercaptans present will tend to settle to the bottom of the hole due to their higher specific gravities. For this reason, shut-in-wells should be blown for several minutes before testing, to be sure that a true sample is run into the absorbers. Whenever possible, samples are taken from the well head, the closest point to the source of the gas.

The flow of gas through the absorbers is regulated by the control valve, while the bleeder valve enables a more representative sample to enter the washing bottles. The gas is passed at a rate of about 2 cubic feet per hour. The formation of a yellow cadmium sulfide precipitate indicates that the gas contains appreciable quantities of hydrogen sulfide and the solution is approaching its saturation point. For wells containing this sour gas approximately .3 cubic feet of gas is passed. On the other hand, if there is no color change in the cadmium sulfate solution, the test is allowed to run from 2 to 4 cubic feet.

Upon completion of the test, the absorption train is disconnected and carried to the laboratory for titration. The cadmium sulfate solution reacts with hydrogen sulfide to give a cadmium sulfide precipitate and sulphuric acid.

$$CdSO_4 + H_2S = CdS + H_2SO_4$$

The volume is brought up to approximately 75 cc. with distilled water and 10 cc. of .025 N iodine solution added, followed with 15 cc. of concentrated hydrochloric acid added to dissolve the precipitate.

$$CdS + 2\ HCl = H_2S + CdCl_2$$
$$H_2S + I_2 = 2\ HI + S$$

The titration of the excess iodine with .025 N sodium thiosulfate solution is carried out in the same absorption vessel. Freshly-prepared starch solution is used as an indicator and is not added until nearly all of the iodine color has disappeared. This gives a very sharp endpoint which can easily be detected. The final chemical reaction is as follows:

$$I_2 + 2\ Na_2S_2O_3 = 2\ NaI + Na_2S_4O_6$$

The formula for the calculation of the hydrogen sulfide present is as follows:

$$G = \frac{(I - S)\ (.6573)}{V}$$

Where:

G = Grains of hydrogen sulfide per 100 cu. ft. of gas.
I = Iodine solution used, cc.
S = Sodium thiosulfate solution used, cc.
V = Corrected gas volume, cu. ft. (60° F. & 14.7 #/sq.).

The factor .6573 is arrived at in the following manner:

17.0378 grams of H_2S per 1000 cc. × 15.432 grains per gram × .025 normality.
= 6.573 grains per 1000 cc. per one cu. ft. of gas
= .006573 grains per cc. per one cu. ft. of gas
= .6573 grains per cc. per 100 cu. ft. of gas.

In the case of the mercaptan gas, the reaction is as follows:

$$AgNO_3 + R\text{-}SH = AgRS + HNO_3$$

Then 40 cc. of .025 N sodium chloride solution are added forming a white precipitate of silver chloride and the neutral sodium mercaptide.

$$AgRS + NaCl = AgCl + NaRS$$

(Concluded on page 60)

"Gild" Holds Eighth Annual Dinner

"One-third of the Gild's history has been written during war years. We are looking forward to greater peace-time efforts in alliance with America's oldest utility and her most modern service."

With these words, C. Edwin Bartlett, Bartlett & Co., Philadelphia, Pa., closed the eighth birthday gathering of the Gild of Ancient Supplers, held May 15 at the Meridian Club in that city, with more than a score of Supplers from the immediate area attending.

As Mayor of the Gild, Mr. Bartlett reviewed progress since its inception May 5, 1937, at Skytop, Pa., during a meeting of the Pennsylvania Gas Association. He reported that the Gild has grown steadily from 17 charter members to 201 on the rolls this year.

"The gas industry experience of these supplers total 5000 years, and sometimes we fear that it will be another 5000 years before the gas business gets a fair break from combination companies," Mayor Bartlett continued. "The war has accelerated gas progress by 10 years, and research by competing fuels has stimulated further efforts on our part.

"We have high hopes for free markets in all cities, with coordinated dealer programs to hasten gas load-building. Such programs are not new; basic material for such activities has been in American Gas Association files for a quarter-century. Policies being adopted now were fathered largely by appliance manufacturers and distributors, so the Gild can continue to be 'the keeper of morale.'

"The Gild should not be awed by electronics and plastics and the 'bright new world of tomorrow' but will continue to be guided by 'the law of gravitation in commercial markets'."

John B. Wynne, Detroit-Michigan Stove Co., presided at the dinner as warden of the Philadelphia area. He arranged a boned shad and shad roe menu, with fresh asparagus supplied by Jacob B. Jones, Bridgeton (N. J.) Gas Light Co. A feature of the dinner was the lighting by Mayor Bartlett of eight candles on an appropriate birthday cake.

Major Alexander Forward, managing director of the American Gas Association reported that 20 years ago this organization's budget was $20,000; last year some $2,000,000 was allocated by the control committee for research, promotion, advertising, and other activities.

"More favorable interest rates are offered gas companies by financial interests as a result of coordinated promotion by utilities and allied manufacturers," he declared. He suggested that the Gild revive its annual award to the individual selected as contributing most to the industry.

F. R. Fairchild, Cruse-Kemper Co., suggested an annual award to "the most intelligent purchaser in the gas industry" and the Supplers spontaneously broke into song, "I Had a Dream, Dear, You Had One Too."

Senior Warden Joe A. Mulcare, Mulcare Engineering Co., read greetings from the former mayor, William S. Guitteau, American Meter Co.; and from the regional wardens, Stephen D. Day, Barrett Co., Houston, Tex.; M. J. Harper, Pittsburgh Equitable Meter Co., New York, N. Y.; David S. Sharpe, George D. Roper Corp., Atlanta, Ga.; George P. Velte American Stove Co., Boston, Mass.

Sol W. Weill, Geo. D. Roper Corp., Philadelphia, confounded the group with magic, and urged enthusiasm, courage and faith in the years ahead.

In addition to those already mentioned, Supplers present were:

Harold O. Andrews, *Gas Age;* Walter A. Barrows, Barrows & Co.; Cyril T. Chapman, Ingersoll-Rand Co.; Thomas H. Clark, E. J. Lavino & Co.; Carl A. Goodwin, Bartlett & Co.; L. M. Humrichouse, Elk River Coal & Lumber Co.; Albert F. Jenkins, Geo. D. Roper Corp.; C. M. Jewell, Detroit-Michigan Stove Co.; W. J. Kite, Jr., Allied Chemical & Dye Corp.; Stanton G. Krake, *American Gas Journal;* Joseph A. Messenger, Buell Engineering Co.; Leslie B. Moxon, United Engineers & Constructors; Glenn H. Niles, consulting engineer; Harold W. Springborn, *Gas Age;* J. M. Traugott, Bryant Air-Conditioning Corp.; Edward B. Wilson, E. B. Wilson & Co.; Duncan A. Worrell, Bartlett & Co.

Gild of Ancient Supplers 8th Birthday dinner, May 15, Philadelphia, Pa.
Seated, left to right: "Christy" and his groan-box; Messrs. Bartlett, Forward, Wynne, Mulcare, Kite and Clark.
Standing, left to right: Messrs. Messenger, Chapman, Traugott, Niles, Krake, Wilson, Humrichouse, Moxon, Goodwin, Springborn, Barrows, Worrell, Andrew, Jenkins, Weill, Jewell and Fairchild.

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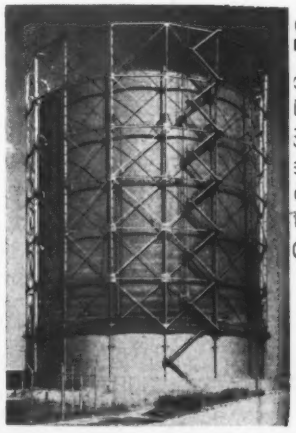

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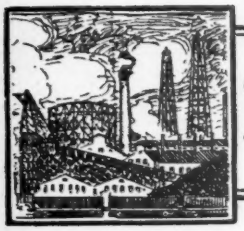


News of the Gas Industry

Expansion Program of Manufacturing and Distribution Facilities of Brooklyn Union Gas Co.

The Brooklyn Union Gas Company, Brooklyn, N. Y., plans to spend at least $5,213,000 during the coming year on an expansion program which will increase the capacity of its gas manufacturing facilities by 20,000,000 cubic feet a day.

Surveys made by the Brooklyn utility have indicated that increased use of gas for heating homes and other purposes may, within five years after the war, add 40 to 50 million cubic feet to the company's send-out on peak days.

President Clifford E. Paige, in announcing the plans, said the expansion program will take care of anticipated needs during the first two or three postwar years. He indicated that further additions to plant capacity will be made as the need arises.

The present capacity of the company's two manufacturing plants is about 135 million cubic feet per day. This has been adequate to supply all normal demands, but steadily rising sendouts have wiped out most of the margin by which manufacturing capacity exceeded maximum demands, and additions to plant therefore became necessary to provide for anticipated further increases.

The immediate program calls for the installation of two additional gas generators at the company's Greenpoint Works, new purifying equipment at its Cützens Works, more than two miles of 42- and 48-inch high pressure transmission mains, three new compressors, and a vast amount of auxiliary equipment.

At the company's Greenpoint Works the Generator House and the fuel handling system will be extended about 60 feet to make room for two 10′ x 9′ U.G.I. Mechanical Generator Carburetted Water Gas Sets, each having an estimated capacity of 10,000,000 cubic feet a day when using heavy oil and reforming. They will be equipped with automatic controls, including automatic chargers for refueling.

In the interest of economy the six existing generators in the Greenpoint Works also will be adapted to use heavy oil for enrichment in place of the lighter oils used in the past.

The increase in plant capacity and changeover to heavy oil necessitated including in the plans the installation of a modern high pressure boiler capable of producing 60,000 pounds of steam per hour at 650 pounds per square inch pressure, a million-gallon tar storage tank, additional equipment for cooling and purifying the gas, and an 8-inch pipe line from the company's dock on Newtown Creek to carry heavy oil to the storage tanks.

About 11,000 feet of 48- and 42-inch mains will be laid to carry the gas from the generators to the Maspeth Avenue pumping station and thence about two-thirds of the distance to the Newtown Station, to a point where connection will be made with existing main. At one point the main will split into two 30-inch mains, which will carry the gas under Newtown Creek.

Three Clark angle diesel engine compressors are to be installed in Newtown Station. Each of these will consist of eight vertical power cylinders, directly connected on the same crank shaft to four horizontal double-acting compressor cylinders. The engines will be two-cycle Diesel, each developing 800 brake horsepower. They will be capable of delivering 1,626,000 cubic feet an hour at 20 pounds pressure.

Consolidated Edison Co. Elects H. C. Forbes, V.P.

Harland C. Forbes was elected vice-president of Consolidated Edison Company of New York, Inc., in charge of development and planning, at the organization meeting of the Company's Board of Trustees, May 22nd. Other officers were re-elected. Mr. Forbes succeeds John C. Parker, who having passed the Company's retirement age, was retained as a consultant for special assignments from the president.

Harland C. Forbes

Mr. Forbes has been assistant vice-president of the Company since 1940. He was born on February 21, 1898, at Colebrook, N. H., and was graduated from the University of New Hampshire in 1921. He received a Master's degree at Massachusetts Institute of Technology in 1923. He served two years as an instructor at M.I.T., spent one year with Western Electric Company, and joined The New York Edison Company in 1924. He became research engineer of the Company in 1928 and system engineer in 1932.

Gas Company Sells Utilities Interest

Securities and Exchange Commission approval has been given the sale by the Consolidated Electric and Gas Company of its interest in Florida Utilities Company to J. L. Terry, Princeton, N. J.

Florida Public Utilities company holdings include the local gas company, serving West Palm Beach, Palm Beach and Lake Worth, as well as electric, water and ice plants at Marianna and Fernandina.

Portland, Ore. Promotes Gas Service in Radio Program

"Let's Talk Houses," an original radio program sponsored by Portland (Ore.) Gas & Coke Company and featuring members of the Portland Home Builders' Association, is currently building good will and prestige for all concerned.

Each weekly broadcast covers a different phase of home building and features a panel discussion by a different group from the Home Builders' Association. Only an occasional outside participant is necessary, inasmuch as associate and affiliate members represent allied building trades and the building supply dealers.

Brief commercials tie in with gas for heating, cooking, water heating and refrigeration in tomorrow's home.

The half-hour program, aired without script, is informal but well directed by Fred Eichorn of station KXL, who, as moderator, puts the questions and recognizes speakers as they raise their hands.

Scheduled topics for the 13 weekly broadcasts scheduled to run through midsummer are: How to Go About Getting a Home Built; Financing the Home; Relations of Contractor and Architect; Actual Construction; Use of Materials; Making Plans; New Gadgets for Postwar Homes; Plumbing, Heating and Lighting; Interior Finishing; Landscaping; What Women Want in a Home; and Review and Conclusions.

Questions also are invited from the listening audience and are answered on subsequent broadcasts. A keen interest was evident early in the series with some of the participating builders receiving personal inquiries after their broadcasts.

Credit for originating the idea of the broadcast is given by Portland Gas & Coke Company to the Portland Home Builders' Association.

Indiana Gas Association Holds 35th Annual Meeting

Herman G. Horstman, Public Service Company of Indiana, Inc., was elected president of the Indiana Gas Association at the group's 35th annual meeting held in Indianapolis May 3.

Other officers elected at a recent meeting of the Association's board of directors are E. Dell Anderson, Northern Indiana Public Service Company, Hammond, vice-president; and Paul A. McLeod, Public Service Company of Indiana, Inc., re-elected secretary-treasurer.

C. K. Graham, Southern Indiana Gas & Electric Company, Evansville, was elected to the board of directors, and other directors re-elected to three-year terms were H. W. Thornburg, Central Indiana Gas Company, Anderson; and V. C. Seiter, Citizens Gas and Coke Utility, Indianapolis. Holdover directors are R. S. Brunner, Terre Haute Gas Corporation, Terre Haute; E. E. Linburg, Richmond Gas Corp., Richmond; A. E. Hatley, Central Indiana Gas Co., Marion; R. A. Gallagher, Public Service Company of Indiana, Inc., D. T. Burns, Citizens Gas and Coke Utility, Indianapolis, and E. M. Hahn, Kokomo Gas & Fuel Co., Kokomo.

Because of wartime travel restrictions, a streamlined 1-day session of board members and key company executives took the place of the association's annual convention.

Clarence W. Goris, Northern Indiana Public Service Company, Gary, retiring association president, gave a review and preview of the Gas Industry in Indiana. He said,

"Gas has played an important part in the story of Indiana war production. Both manufactured and natural gas were supplied in a never-failing quantity. Manufactured gas was produced in plants located in the state, and natural gas was brought in from the Texas, Oklahoma and Kentucky fields in addition to local supplies from Indiana wells.

"A realization of the tremendous task which confronted the gas industry can be obtained by noting these statistics: in 1939, the member companies of IGA delivered 180,058,684 therms of gas to industrial customers. In 1943, these same companies delivered 300,755,236 therms of gas to industrial customers, representing an increase of 67%. The 1944 figures just released by our Accounting Committee, show a continuation of the high level of gas output."

In discussing postwar activity, Mr. Goris said, "There is no doubt about it, competition for the kitchen load in tomorrow's home will be keen. We must be ready to meet this competition if we are to get our share of the tremendous postwar market. We must be ready to turn our blueprints into reality, and this can be done only through aggressive and intelligent selling policies and with a properly trained sales force."

J. M. Pickford, Northern Public Service Company, Hammond, gave the technical committee report and discussed the humidity problem in connection with domestic gas users, and the research work being done now at Purdue University in addition to the many other activities of his committee. G. M. Johnson, Northern Public Service Company, and Dr. J. L. Bray, head of the school of Chemical Engineering, Purdue, discussed the humidity problem further in a Research Committee report.

Herman G. Horstman Pres.
Indiana Gas Association

E. M. Demlow, Citizens Gas and Coke Company, Indianapolis, gave the sales committee report. He explained that his committee had spent most of the past year studying and working on the development of postwar selling plans and personnel training.

C. V. Sorenson, Northern Indiana Public Service Company, gave the Postwar Planning Committee report, and W. A. McDonough, also NIPS Co., gave the accounting committee report.

J. H. Warden, chairman, residential gas section, AGA, discussed "The Program of the Residential Section of the AGA, Present and Proposed." He said, "A well-trained, well-selected sales organization is the foundation upon which the industry must depend for its future success, and I am in hopes that every company in the country will take advantage of the material offered by the AGA training program."

H. Vinton Potter, director of kitchen promotion, AGA talked on the "New Freedom Gas Kitchen Promotion"; H. Leigh Whitelaw, managing director, Association of Gas Appliance & Equipment Manufacturers, New York, talked on "Problems of the Appliance Manufacturer and His Plans for the Post War Period"; John W. West, Jr., assistant managing director, AGA, discussed "The AGA Expanded Program for Research and Sales Promotion," and the meeting adjourned with a message by J. French Robinson, AGA president.

Louis C. Smith Elected President P.G.A.

Louis C. Smith, president of the Harrisburg Gas Company, of Harrisburg, Pa., was elected president of the Pennsylvania Gas Association at its annual meeting, held in Philadelphia May 16th. Representatives from manufactured gas companies throughout the State attended the meeting.

"The gas industry is faced with great responsibilities," said Mr. Smith in addressing the meeting. "The need for continued aggressive action has been recognized and organized to improve the postwar economics of its business and to meet competition. A campaign has been launched by the American Gas Association to appropriate an additional amount of $1,400,000 per year for three years to finance an extended program of research, national advertising, and general promotional effort. Local gas companies have been asked not only to endorse this program, but to support it with increased local newspaper advertising to promote the various uses of gas fuel."

Mr. Smith was graduated from the University of Pennsylvania in Mechanical Engineering, in 1907. He joined The United Gas Improvement Company in 1908, in Philadelphia. Later he became associated with the Omaha Gas Company; was president of the Fulton County Gas and Electric Company, Gloversville, New York; vice-president of the New York Power & Light Corporation, Schenectady, New York; and was on the staff of the American Gas Association as assistant managing director. Mr. Smith has been president of The Harrisburg Gas Company since 1935.

Other officers of the Association elected at the meeting, were *1st Vice President,* F. H. Trembly, Jr., Philadelphia; *2nd Vice President,* J. M. Huebner, Lancaster; *3rd Vice President,* E. G. Boyer, Philadelphia; *Secretary,* Wm. Naile, Lebanon; *Treasurer,* James A. Schultz, Reading.

Council 3 years: Allyn C. Taylor, Reading; J. A. Frick, Allentown; H. H. Ganser, Norristown; J. M. Traugott, Philadelphia.

Council 1 year: H. C. Snider, Pottsville, Pa.

Independent Natural Gas Association Appoints Whyte as Supervisor

The appointment of Louis E. Whyte of Washington as Supervisor of the Educational Department of the Independent Natural Gas Association is announced by John A. Ferguson, Executive Director.

Mr. Whyte, who entered upon his duties May 1, comes to the Association with some 15 years of experience in Washington with newspapers, trade journals and business information service organizations. He left the staff of the Bureau of National Affairs, an affiliate of the United States News organization, to accept the INGAA position.

His work will include the handling of news releases, collection and dissemination of material of interest to Association members and conducting a program designed to educate the public generally as to the problems of the industry.

He is at present spending some time in Oklahoma City and other parts of the Southwest to acquaint himself with industry people.

Metropolitan Gas Heating and Air Conditioning Council Holds Annual Meeting

John J. Wholey, Rockland Gas Company, Spring Valley, N. Y., was elected chairman of the Metropolitan Gas Heating and Air Conditioning Council at the annual meeting of that organization which took place May 16 at the offices of Consolidated Edison Co. of New York.

Edward J. Gerridge, The Brooklyn Union Gas Company, was named vice-chairman and James E. Cook, Westchester Lighting Co., Mt. Vernon, N. Y., was selected for secretary-treasurer.

Principal speakers at the meeting were Gebhard C. Beck, The Brooklyn Union Gas Company, and W. Daniel Williams, Public Service Electric and Gas Co., Newark, N. J. Mr. Beck presented a valuable paper on "Winter-Summer Water Heating from Gas-Fired Boilers," while Mr. Williams described the Home Planners' Institute of New Brunswick, N. J.

The Home Planners' Institute, one of 70 similar institutes operating in various parts of the country initiated by the National Retail Lumber Dealers Association, is designed to encourage savings which will be earmarked specifically for home acquisition after the war. More than 300 other cities, in addition to those now operating such institutes, have indicated their interest in setting them up. The New Brunswick unit Mr. Williams said, is sponsored jointly by the Chamber of Commerce, Public Service Electric and Gas Co., and the local newspaper.

Toluene Plant at Lake Charles, La.

Construction for the government of a $20,000,000 war plant for making toluene has been undertaken by the Cities Service Refining Corporation at Lake Charles, La.

The plant, which will be one of the largest of its kind in the country, will be capable of producing 2,000,000 gallons of toluene a month. With practically no change, it could turn out a much larger quantity of blending agents for high-octane gasoline.

The new project is being built by Cities Service as agent for the Defense Plant Corporation. The M. W. Kellogg Company is under contract for design and construction of the plant.

The plant is located in Lake Charles, La., on 327 acres adjacent Cities Service's new aviation gasoline refinery and the butadiene and synthetic rubber plants of the Defense Plant Corporation. Actual work on the plant site started on March 26th, and construction work is scheduled to be finished on February 1, 1946.

E. L. Hall Joins A.G.A. Staff

Appointment of Edwin L. Hall as Secretary-Coordinator of the Gas Production Research Committee of the American Gas Association effective May 15 has been announced by J. French Robinson, president of the Association. Mr. Hall resigned as manager and treasurer of the Manchester Gas Company, Manchester, N. H., to join the A.G.A. staff. His successor at Manchester is Edward Niederer, Jr., formerly of the Bridgeport Gas Light Co., Bridgeport, Conn.

Edwin L. Hall

As Secretary-Coordinator of the committee headed by P. T. Dashiell of Philadelphia, Mr. Hall will supervise gas production research activities of institutions and plants where projects sponsored by the committee are undertaken.

A 1924 graduate of Ohio State University with a Bachelor of Metallurgical Engineering degree, Mr. Hall has spent his entire business career in the gas industry and has had extensive operating experience with various gas production processes.

New Research Bulletin Explores Oven Heat Distribution

A comprehensive research bulletin dealing with problems in range oven heat distribution has been completed by the American Gas Association Testing Laboratories for approval by the Committee on Domestic Gas Research. It forms the tenth of a series devoted to Domestic Gas Cooking Research.

Results of latest studies on a number of typical gas ranges are presented, including effects of a variety of experimental constructional changes and the influence they exert on oven heat distribution. Information now made available for the first time should prove of great practical assistance to manufacturers and designers in attaining improved oven baking performance.

The new bulletin charts predominating effects on oven heat distribution observed in different ranges examined due to such constructional changes as variations in location of oven burner, size and location of oven bottom openings, area and location of flue outlets, changes in oven bottom insulation, and location of the thermostat bulb.

Resultant effects on heat distribution are evaluated on the basis of standard cake baking tests currently employed in gas range approval tests. Variations in the degree of brownness are accurately determined by a photo-electric reflectometer as used in regular testing procedures. In addition to cakes, pies, cookies and biscuits were baked to be sure that ovens capable of good cake baking performance would handle other types of baking equally well, thus providing a wide degree of flexibility.

W. Harold Duguid, Elected President Meter Assn.

W. Harold Duguid, General Manager, Jacksonville Gas Co., has been elected President of the Gas Meter's Association of Florida and Georgia.

Other officers elected by the meter group include, W. Bond Collins, of the People's Water and Gas Co., Miami Beach, vice president, and Buill G. Duncan, of the Florida Power Corp., Orlando, secretary-treasurer.

The new officers were installed at Daytona Beach, May 18. The Gas Meters' association is composed of gas companies in both Georgia and Florida.

CRUSE-KEMPER COMPANY
AMBLER, PA.
GAS HOLDERS
Low Pressure High Pressure Inspection
Purifiers Tanks Flues Etc.
Over 40 Years of Sound
Steel Plate Construction

N.E.G.A. Home Service Educational Conference

The directors of The New England Gas Association have approved plans of the Home Service Group of the Association for holding a 5-day Home Service Development Conference in Boston from September 17-21.

Speakers and lecturers will address the Conference on a variety of basic subjects of direct interest to gas company Home Service representatives.

Among the scheduled subjects of a background type are: "The History of the Gas Industry," "The History of Home Service," and "The Aims of Home Service." Among the subjects on consumer education are: "home calls," "visual aids," "Radio in Home Service," and "press contacts." Among the appliance servicing subjects and the equipment presentations will be such topics as ranges, refrigerators, water heaters, kitchen heating, space heating, air conditioning and commercial appliances. There will also be discussions of the manufacture of gas, possibilities of Home Service in revenue building, the conducting of surveys, gas equipment coordination, kitchen planning, speech training and an appraisal of post-war gas appliance developments.

Mrs. Lillian P. Dunbar of Cambridge, Past Chairman of the NEGA Home Service Group, is the chairman of the NEGA Home Service Educational Committee. With the aid of about 15 consultants, both within and without the industry, the committee has been preparing plans for the Conference for nearly a year. During the first part of the committee's work, Mrs. Hazel Cheever of Arlington was the chairman of the NEGA Home Service Group. Miss Susan A. Mack of Boston is the present chairman. The Group operates as part of the NEGA Sales Division of which R. E. Finnin of Boston is the Chairman.

In planning the Conference, the committee queried the New England gas company managers as to their probable interest in the proposed week's Conference and found a wide-spread interest in sending company Home Service representatives to attend. The Conference will be held in compliance with ODT requirements.

The Home Service Development Program Subcommittee of the Educational Committee has also prepared a comprehensive outline of text material which will be used as a training course in the local gas companies and which will be in addition to the September Conference in Boston. The outline for the company training course covers pertinent gas industry fundamentals, a study of gas equipment, the techniques and operation of Home Service work and sales training, information on company organization, rate schedules and other company, technical and Home Service subjects that would be of a special value to persons newly employed as Home Service representatives.

About 12 subjects are presented under company organization. The essential activities of the plant, of the distribution department, of the meter department, of the service department and of the customer accounting department are covered. There is also a section covering pertinent basic information regarding public utilities, their place in a community and their regulatory aspects.

The purpose of the well-rounded material which will be presented covering the company training program, will be to give a new home service representative a well-rounded background in all of the factors which she will need in connection with her work and would be applicable to all of the New England gas companies, except for the one phase of specific local company policies. It is felt that the company training program will require between 1 and 2 months of study by those who take the course.

Consolidated Edison Co., New York, Announces Postwar "Completed Home" Program

Predicting the building of 90,000 one and two-family houses in New York City and Westchester County by 1954, Consolidated Edison Company May 7th announced a post-war program to make these structures "completed homes"—that, is buildings initially equipped with all modern conveniences of living, the whole sold as a living unit.

At a meeting in the auditorium of its main office building at No. 4 Irving Place, attended by executives of Edison System Companies and other utilities of the State, representatives of savings banks and builders, the Company explained the social and economic advantages of well-built, completely equipped homes ready to move into. It invited the cooperation of other industries in the movement and announced a series of meetings to present the idea to banks, savings banks, savings and loan associations, architects and builders.

Defining the "completed home," L. A. Scofield, general sales manager of the company, said it must be well built, good looking, well planned and convenient to care for, be easy to operate and economical to maintain and be financed by the lending institutions as one transaction, including all essential equipment.

"Offering a post-war program at this time," said Mr. Scofield, "perhaps is well in advance of actual construction, but we are doing so because of the many approaches that are now being made by governmental agencies and private interests in all industries. If there is one idea that we desire most of all to get across, it is the fact that in peace-time America we must get away from unstable, insecure or flimsy material goods.

"Our primary concern, obviously, is to sell more service. We think that the utility companies should be looked upon as leaders in the better living of peace-time America. We know that a wonderful opportunity now exists to present ideas with respect to adequacy of space and facilities which in the past have prevented full utilization of the services of which we are so proud. In addition we have an obligation to our existing customers in fostering a program that would encourage them to modernize existing structures so that when the gas and electric devices appear on the market post-war, they can be put in use. We felt that if the problem was pointed out, the lending institutions would come to some mutual convenient arrangement to make it easier for the customers to purchase the appliances in connection with their new construction and modernization plans."

For presentation of the theme to architects, builders and financial institutions, the Edison Company has prepared a colorful broadside bulletin in bound form amply illustrating the ideas and plans set forth.

A-B Stoves Will Operate as Division of Detroit-Michigan Stove Company

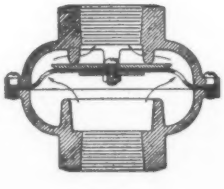
At a special meeting of the stockholders of A-B Stoves, Inc., of Battle Creek, Michigan, held on Tuesday, April 24, 1945, the plan of reorganization as submitted to A-B Stoves, Inc., by the Detroit-Michigan Stove Company was accepted and adopted.

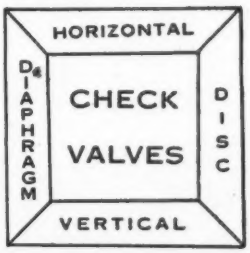
Effective Wednesday April 25, 1945, A-B Stoves, Inc., will operate as A-B Stoves Division of the Detroit-Michigan Stove Company. Mr. Wendell L. Smith, President of A-B Stoves, Inc. was elected to the Board and also an Executive Vice President of the Detroit-Michigan Stove Company.

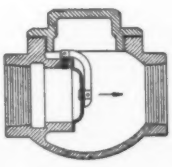
Mr. Smith will continue as the Executive Officer of the A-B Stoves Division and will retain the present personnel.

This reorganization brings together two oustanding companies in the gas and electric appliance field. Mr. John A. Fry, President of the Detroit-Michigan Stove Company, announces that this is the first step taken in carrying out a comprehensive program for the post war period to better serve the customers of both companies.

Pressure Controls for Gas and Air







NORWALK VALVE COMPANY

35 Railroad Ave. South Norwalk, Conn.

Handley Elected Chairman Gas Water Heater Section of A.G.A.E.M.

Harold Handley, President and General Manager of the Handley Brown Heater Company, was elected Chairman of the Gas Water Heater Manufacturers' Section of the Association of Gas Appliance & Equipment Manufacturers at a recent meeting in Denver, Colorado. This Section represents all the leading Water Heater Manufacturers in the United States. Mr. Handley, who has served as Vice-Chairman during the past two years will take office as Chairman October 1st.

Harold Handley

Active in the affairs of The American Gas Association, Mr. Handley is also a member of the Conversion Burner Manufacturers' Group of A.G.A.E.M.

The Handley Brown Heater Company, located in Jackson, Michigan, has been producing war materials for both the Army and the Navy. The company's peace time products are Automatic Storage Gas Water Heaters and Conversion Gas Burners for domestic heating.

Milwaukee District Records High Percentage of Gas Ranges

In the 1945 "Consumer Analysis" compiled by *The Milwaukee Journal* the section devoted to cooking ranges reveals some interesting figures on range preference.

The bulk, or 195,303 families, comprising 85.8% of all range owning families own gas ranges while 10.7% own electric ranges.

Electric ranges are most common among the higher income brackets and the percentage of those owning gas ranges increases as incomes decrease.

Preference in purchase of new ranges for replacement indicate Gas, 61.6%, Electric, 38.1%, higher income brackets showing electric trend.

Owners of gas ranges are 85.8% of the total users. Non-owners are 14.2%.

A total of 206 makes of gas ranges are in use in the district as compared with 212 in 1940.

Natural Gas Service Defies April Snow Storm

Service rendered by Northern Utilities Company at Casper, Wyoming, during a heavy snowstorm in April prompted their newspaper display in the Casper Tribune-Herald appearing April 22nd as a 13-inch 3-column advertisement reproduced herewith.

Policemen Assist Elderly Women Marooned in Homes
?
Published in the Casper Tribune-Herald April 15
HOMES HEATED WITH
NATURAL GAS
Did not experience such difficulty during the recent heavy snowstorm.
Underground pipes carry this perfect fuel to the thousands of users and snowstorms do not affect the constant everready supply always at your demand.
MODERN HOMES LET NATURAL GAS DO THE 4 BIG JOBS—
AUTOMATIC HEATING
SPEEDY COOKING
CONSTANT HOT WATER
SILENT REFRIGERATION
JOIN THE HOST OF SATISFIED GAS USERS
BE SURE AND VOTE AT SPECIAL ELECTION ON JUNIOR COLLEGE
Northern Utilities Co.
Distributor of Natural Gas — The Carefree Fuel

An editorial calling attention to a quarter century of gas service reads as follows:

"Casper residents had cause again during the recent storm and cold wave to congratulate themselves on being served with natural gas. There was no worry over fuel under conditions which might have created an emergency and caused some suffering in cities not as fortunately situated.

"What makes this boon significant in 1945, however, is its anniversary distinction. Before the end of the year Casper will have enjoyed this service for a quarter of a century. And during all these years there has never been an interruption in service.

"Natural gas is now being delivered to local consumers through 5,700 meters, which does not represent the total number of housing units served. An apartment house may have a single meter.

"Credit goes to the Northern Utilities Company for the outstanding record made in providing this service without a break. And since this is the silver jubilee year, both company and patrons have something to celebrate."

Appliance Sales Plan-Book For Gas Utilities

A hard-hitting plan book, outlining an aggressive promotional program to capture the interest of the more than 20,000,000 families served by the gas industry, has been released by H. Vinton Potter, director of the New Freedom Gas Kitchen program, to nearly 800 gas utilities throughout the nation. This program is sponsored jointly by the American Gas Association and the Association of Gas Appliance and Equipment Manufacturers.

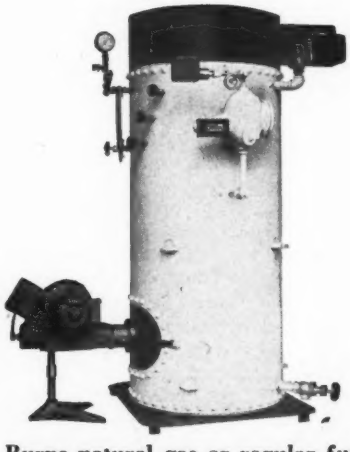
The plan book, which correlates all promotional materials now available and calls for the initiation of immediate and aggressive sales steps preparatory to the release of kitchen equipment, emphasizes the vital necessity of all-out promotion of the kitchen program to the industry.

It summarizes the broad range of sales training, financing and other materials made available by the Association to members of the gas industry, offers a check list of advertising materials, many at new lowered prices, and underscores the necessity of immediate action on the sales front.

The plan reveals for the first time the broad extent of promotional materials now available, or soon to be made available in the American Gas Association's expanded program of advertising. Color films, local newspaper mats, a photograph service, radio scripts, and outdoor posters, are among the many materials for promotion made available as part of a complete promotion package stemming from the Association's national advertising program.

The plan book reveals that the major emphasis of the current program will be on the industry's New Freedom Gas Kitchen, focal point of the gas industry's national advertising program, now appearing in a large list of leading magazines.

LATTNER
GAS — OIL BOILER
3 HP to 35 HP.



Burns natural gas or regular furnace oils with equal efficiency using same burner.

P. M. Lattner Mfg. Company
Cedar Rapids, Iowa

Domestic Gas Research Conferences

The first of a series of the regional Domestic Gas Research Conferences was held in Cleveland, O., May 8th and 9th. Enthusiastic reception of technical papers together with well attended general and panel sessions, indicating a keen interest in current research at the American Gas Association Testing Laboratories.

These meetings give appliance manufacturers' engineers an opportunity to familiarize themselves with technical data resulting from the research program now in progress and to discuss problems directly with members of the Laboratories staff and members of the research committees.

Kitchen ventilation was perhaps the outstanding topic at the Cleveland meeting. Leon Ourusoff, a member of the Technical Advisory Subcommittee for Domestic Gas Cooking Research, reviewed results already obtained in this study, emphasizing removal of heat, moisture and cooking odors. Dr. R. S. Taylor, of Servel, Inc., contributed an engineering discussion of these three features. Also of lively interest to the delegates was information presented on the design of gas burners. These topics were thoroughly discussed in afternoon panel sessions. Mr. Ourusoff's paper is printed in this issue of the JOURNAL.

During the general sessions 7 technical papers were presented by Laboratories staff members. Four others were delivered before the panel sessions where principal discussion took place. William R. Fraser, of the Michigan Consolidated Gas Company, presided at the opening general session and Franklin T. Rainey, of The Ohio Fuel Gas Company, presided on the second day.

Other Conferences were held in New York on May 23 and 24 and in Chicago on June 6 and 7, under the sponsorship of the Association's Committee on Domestic Gas Research.

Arrangements for all Conferences are being handled by Eugene D. Milener, Secretary of the Committee on Domestic Gas Research.

A.G.A. Southwest Personnel Conference

The ninth meeting of the American Gas Association Southwest Personnel Conference was held in the Washington-Youree Hotel, Shreveport, Louisiana, on June 5th. Mr. M. V. Cousins, Personnel Director of the United Gas Pipe Line Company, was chairman of the conference.

The more critical over-all personnel problems such as experience with revised selective service regulations, wage stabilization, reemployment of veterans, foremanship training, and foremen's relationship to management were discussed.

Joins Westcott & Greis

Dean D. Ault has joined the Westcott & Greis division of American Meter Company as field engineer, with headquarters at Houston.

His background of experience makes him well fitted to serve the gas and petroleum industries in the territory, where he is well known and highly regarded for his work on recording instruments and automatic control applications in the gas and petroleum industries, and remote automatic control and loading of natural gas regulators.

Dean D. Ault

Mr. Ault served in the U. S. Navy in World War 1. He is a graduate of the University of Arkansas, class of 1924, and of the Chicago Central Station Institute. He holds the degree of Bachelor of Electrical Engineering.

GLOVER-WEST

CARBONIZING SYSTEMS

• *boost* production

• *cut* fuel costs

440 CARBONIZING PLANTS, in 20 countries, testify to the outstanding advantages of GLOVER-WEST Systems.

Today, with the fate of civilization depending on the speed and efficiency of our war-output, these advantages cannot be overstressed:

GLOVER-WEST CARBONIZING SYSTEMS
- ***LOWER*** Fuel Consumption and Maintenance
- ***FACILITATE*** Operation
- ***PRODUCE*** dryer, cooler Coke
- ***REQUIRE*** less Ground Area
- ***INSURE*** greater Flexibility

WEST GAS IMPROVEMENT CO.
424 Madison Ave., New York, N. Y.

GPM
IRON HYDROXIDE

The mark of
unerring dependability
in purification

GAS PURIFYING MATERIALS CO., INC.
3-15 26th Ave.
Long Island City 2, New York

COMPLETE GAS PLANTS

•

INDUSTRIAL FURNACES

•

THE GAS MACHINERY CO.
16100 Waterloo Road
Cleveland 10, Ohio

Estate Distributing Co. to Operate in Cincinnati

Plans for distribution of Estate Heatrola products in the Greater Cincinnati area were completed recently with the formation of "Estate Distributing Company." The new company, a subsidiary of The Estate Stove Company, Hamilton, Ohio, will headquarter at the parent company's home office until release of civilian goods, when offices and show rooms will be opened in Cincinnati.

S. C. Bernhardt, Estate Vice-President in Charge of Sales, in making the above announcement, stated that because The Estate Stove Company has changed its sales policy from direct dealer selling to sales through independent specialty distributors, they want to learn of the distributors' problems at first hand. Entering the distribution field in Cincinnati provides this opportunity, as well as providing a proving ground for sales training and sales promotion plans.

Although definite merchandise policies of the new company are not yet fixed, Mr. Bernhardt revealed that the Estate Distributing Company has recently signed a franchise with the Hurley Machine Company for the distribution of Thor automatic washers, dishwashers and automatic Gladirons. There is a strong likelihood that they will seek the franchise of a selected few additional top major appliance lines. Ray C. Thomas has been appointed manager of the new company, having

S. C. Bernhardt, (left), discusses plans with Ray C. Thomas (right).

joined The Estate Stove Company in 1937 as sales correspondent. In 1939 he was appointed district manager for the South Central Ohio territory with headquarters at Hamilton.

Tentative plans call for the Cincinnati location to be in or near the downtown shopping center so that dealers' customers can conveniently visit the show rooms to see complete displays of Estate Heatrola and Thor products. No retail sales, however, will be made by the company.

The new company will immediately begin to franchise dealers in the territory in which they will operate. This territory comprises, roughly, the Southwestern section of Ohio, ten counties in Kentucky and five in Indiana. Estate Heatrola products will be sold only through these authorized agencies.

In other areas, T. A. O'Loughlin & Company, 1060 Broad Street, Newark, N. J., will represent The Estate Stove Company as Estate Heatrola distributor in the Newark distributing area, and the Consolidated Sales Company, 308 N. Laurel St., Richmond, Va., will be the Estate Heatrola distributor in the central area of Virginia.

Oil Shale Research

A contract for the construction of the new oil shale research and development laboratory of the Bureau of Mines at the University of Wyoming in Laramie has been awarded to E. C. Nickle of Arcadia, Calif.

The laboratory is an integral part of the National synthetic liquid fuels demonstration program to enable the United States to get gasoline and other liquid fuels from coal and shale when and if natural petroleum resources are depleted or exhausted.

Facilities will be provided for laboratory and small pilot plant experimental studies on processes for refining shale oil, retort testing and development, and other research. Provision also will be made for offices, a library, machine shop, drafting and blue-printing, and other needs of the 70 additional technical and administrative employees to be stationed at Laramie. Some of the equipment for the new building already has been ordered to offset any delay in delivery, and orders for the rest will be placed shortly.

The laboratory will be operated in conjunction with a $1,500,000 oil-shale demonstration plant which will be established on United States Naval Oil-Shale Reserves in Western Colorado. A site has been chosen in the Anvil Points area, about 7 miles west of the town of Rifle, and initial work is under way on this plant which will serve as a proving ground for processes to convert the Nation's large reserves of oil shale into fuels and lubricants.

Robertshaw Twenty-year Club Holds Meeting

The Robertshaw Twenty-Year Club held its first annual banquet and organization meeting April 11, 1945, at the Greensburg Country Club. Attending this banquet were 87 members of the Robertshaw Thermostat Company who have been with the company fifteen years or more.

The Twenty-Year Club is being set up on the basis of the Craftsmen Guild, consisting of "Apprentices" who have been with the company from 15 to 20 years; "Journeymen" who have been with the company 20 years but less than 25 years, and "Master Craftsmen" who have been with the company 25 years and over. The objects of the organization are: To foster loyalty to Robertshaw Thermostat Company; to develop greater interest among younger employees in the company and its products; to carry on the traditions of quality and service upon which the company was founded; to increase sociability among the members; to perpetuate the memories of years of association and efforts in design, production, sale and service on Robertshaw products.

Gas Control Bulletin

A new and instructive manual on the application and operation of automatic gas heating controls has been published by General Controls, 801 Allen Avenue, Glendale 1, California. The bulletin, S1-100, consists of 32 pages bound with cover and includes many applications of gas control valves, with detailed drawings showing their specific applications on various hook-ups. The drawings are made in perspective to permit easy interpretation.

A feature of the bulletin is a presentation of service troubles that may occur. Possible causes of the trouble and remedies are indicated.

The Reliable Shut-Off for Street Mains

THE GOODMAN STOPPER

Now has the "Z" handle for easy manipulation. When locked in place it holds. Stopper cannot slip. Gas cannot pass. Adjusted in 30 seconds.

Ask for circulars on this and other distribution equipment.

Nearly a half century of service to the Gas Industry.

Safety Gas Main Stopper Co.
523 Atlantic Avenue, Brooklyn, New York

Gorham W. Woods Joins Lincoln Electric

The addition of Gorham W. Woods to its engineering staff has been announced by The Lincoln Electric Company, Cleveland, Ohio, world's largest producers of arc welding equipment.

Joining the company as research engineer, Mr. Woods will devote a major part of his time to the development of electrodes, a post for which he is well qualified in view of his many years of experience in the field of chemistry and metallurgy.

A graduate of Rice Institute of Houston, Texas, he received his B.S. degree in Chemical Engineering in 1923.

A registered professional engineer in the states of Texas and Ohio, Mr. Woods is a member of the American Welding Society and in 1940-41 was Chairman of the South Texas Section. He has done considerable research and experimental work in the development of welding electrodes, materials and processes.

101 Welding Ideas For Low Cost Maintenance

Bulletin No. 405 issued by Lincoln Electric Company, Cleveland 1, Ohio, is replete with illustrations coupled with brief descriptions of reclamation and repair jobs performed by Lincoln arc welding.

A wide variety of applications attest to the comprehensive use of the many types of electrodes employed. Heavy and light equipment are included in the specific jobs illustrated including redesign and reconditioning of gas valves.

Copies of this bulletin are available through the main office or any branch office.

Clark Mfg. Co. Announces Change in Sales Policy

A major change in the nationwide sales and distribution of its products is announced by The Clark Manufacturing Company of Cleveland, Ohio, manufacturers of steam specialties and fluid controls extensively used in the Gas Industry.

During the past 37 years, steam and vacuum traps, pressure regulators, separators, and other steam specialties have been manufactured by Clark and marketed under the name of "Strong Steam Specialties." For this reason, the identity of the Clark company itself has been little known in the field, although the products manufactured by it have been widely distributed.

A change of policy, developed during the past several months and put into action on this date, brings all of the activities of product designing, engineering, manufacturing, sales and distribution under the one roof of The Clark Manufacturing Company. From now on the Company's products will be sold as "Clark Fluid Controls."

W. S. Goff, who assumed presidency of the Clark company 18 months ago, announces that the concern henceforth will maintain its individual identity, and that it will deal directly with its distributors and customers on a nation-wide scale.

Sweedler Leaves Allied Chemical

Benjamin Sweedler, for several years supervisory patent attorney for Allied Chemical & Dye Corporation, has resigned to open offices for general practice of patent, trade mark and copyright law in New York.

Benjamin Sweedler

Prior to 1927, when he joined the patent division of Allied Chemical, Mr. Sweedler had been a patent examiner in the United States Patent Office and later served the Western Electric Company as patent attorney. He has handled patent, copyright and trade mark matters including appeals before the courts, directed the preparation of contracts, prosecution of interferences and the preparation of opinions on patent and trade mark causes. During recent years, his duties were chiefly concerned with gas manufacturing processes and equipment, coke ovens, tar derivatives and processes for their manufacture, and related fields.

Mr. Sweedler's offices are located at 420 Lexington Avenue, New York 17, to serve the gas, metallurgical and processing industries.

H. L. Spindler Advertising Mgr. American Radiator—Standard Sanitary

American Radiator & Standard Sanitary Corporation has announced the appointment of Howard L. Spindler as Manager of Advertising and Sales Promotion, to succeed the late Charles B. Nash.

Mr. Spindler has been associated with the Corporation for 18 years, having served in the company's Milwaukee, Baltimore and Richmond Sales Offices. He came to Pittsburgh in 1940 as Assistant Manager of the Pittsburgh Sales Office, and has since been closely connected with the work done by the Corporation in its "home" office.

In each of his posts with American Radiator & Standard Sanitary Corp., Mr. Spindler has been engaged extensively in both sales and sales promotional work.

He is a graduate of the University of Wisconsin, where he studied Business Administration and is also a member of the Kiwanis Club and Sales Executive Club of Pittsburgh.

Test Laboratory Established by Bryant Heater Co.

A wellequipped 1500 sq. ft. laboratory in nearby Mentor, Ohio, for the testing of appliances under conditions of manufactured gas consumption is the latest addition to the research facilities of the Bryant Heater Company, Cleveland, Ohio. In contrast to Cleveland's natural gas, Mentor is supplied with coke oven gas of 530 BTU with a specific gravity of approximately 0.4. This type of gas corresponds to that specified for tests by the American Gas Association Testing Laboratories.

All new product development at the Bryant Heater Company will be thoroughly tested on both natural and manufactured gas with the aid of these new facilities, as will Bryant furnaces, unit heaters and boilers. The Mentor laboratory will also be used for conversion burner testing on solid fuel burning equipment, and for the adaption of Bryant's new automatic safety pilot to single point flash tube ignition for gas ranges, according to W. R. Teller, Director of Engineering and Development for Bryant.

Order L-174 Revoked

The Office of War Utilities of the War Production Board announced April 30th the revocation of General Conservation Order L-174, which limited new loads on manufactured-gas utilities systems and established machinery for emergency curtailment of service during periods of shortage.

The order was originally issued September 30, 1942, and was last amended December 22, 1943. It prohibited deliveries of manufactured gas to new installations of residential space heating equipment except under specified conditions and limited new industrial loads on manufactured-gas systems in addition to providing the curtailment procedures.

Many manufactured-gas utilities were given individual exemptions from the order during its life, under a provision permitting OWU to exempt systems whose facilities were found to be adequate to meet all demands for service. Revocation of the order is another step in the general WPB program to lift restrictive controls as rapidly as war conditions permit.

Rucker-Vaughn Expands Plant

Expansion of plant facilities and consolidation of sales offices were accomplished the latter part of April by Rucker-Vaughn Company of Oakland, Calif. The company manufactures pressure regulating valves and gas and oil burning equipment, as well as the Arnold Lubricator, an air tool specialty.

According to Clark E. Rucker, in charge of sales, the company has stepped up its production capacity, both through plant expansion and improved production methods. The new developments include an improved service department for the complete rebuilding of used valves, and full valve maintenance service. Production is headed up by Clifford Vaughn.

Obituary

HENRY O. LOEBELL

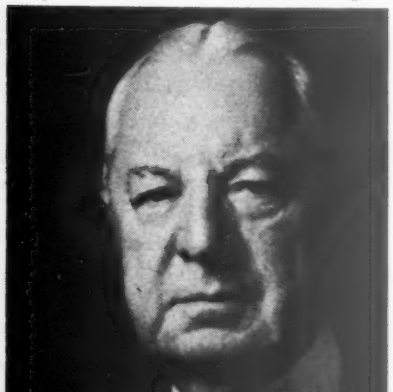
Henry O. Loebell, consultant in the gas, petroleum and electrical industries, died May 4th at Rye, N. Y. He was fifty-nine years old.

In 1919 Mr. Loebell joined the Combustion Utilities Corporation, of 60 Wall Street, New York. He was vice-president and general manager when the company was dissolved in 1939. Since then he has been a consulting technologist.

Mr. Loebell was a member of the American Gas Association and in 1934 won the Charles A. Munroe award. He was the author of more than 100 technical articles.

PHILIP G. GOSSLER

Philip G. Gossler, seventy-four, chairman of the board of Columbia Gas and Electric Corporation, New York, one of the nation's largest public utility holding corporations, died May 18th in New York, after a brief illness.



Philip G. Gossler

Mr. Gossler played a leading part in the development of the utilities system that now operates one of America's largest networks of gas lines, totaling more than 28,000 miles, and owns natural-gas rights to approximately 8,000,000 acres of land. About 70 per cent of the company's interests are in gas, although its operationg companies spread over New York, Pennsylvania, Ohio, West Virginia, Virginia, Kentucky, Maryland and Indiana, also deal in electricity, water, heat and transportation.

Mr. Gossler was born in Columbia, Pa., on Aug. 6, 1870. Educated at Pennsylvania State College, Mr. Gossler received a Bachelor of Science degree in 1890, and a degree in electrical engineering in 1892, pursuing a post-graduate course in electrical engineering at Columbia University in 1893.

In 1890-'91 Mr. Gossler was employed by the Foundry & Machine Company and the Edison General Electric Company at Chester, Pa., becoming assistant engineer of the United Electric Light & Power Company, New York, in 1891. Four years later he went to Montreal as superintendent and engineer of the Royal Electric Company, and in 1901 became general superintendent of the Montreal Light, Heat & Power Company.

Returning to New York in 1904, Mr. Gossler become vice-president of J. G. White & Company, and in 1909 became chairman of the board of Columbia Gas & Electric Company, of which he was elected president as well as chairman in 1922.

EDMUND A. DOYLE

Edmund A. Doyle, Consulting Engineer for The Linde Air Products Company, a Unit of Union Carbide and Carbon Corporation, and a former president of the American Welding Society, died suddenly at his home on May 4. He was 64 years old.

Mr. Doyle was born in Baltimore, Maryland, on January 13, 1881. He received his early education at Baltimore and was graduated from Johns Hopkins University as a Mechanical Engineer. During the first World War, Mr. Doyle served in the United States Army, Corps of Engineers, starting with the rank of first Lieutenant and rising to the rank of Major.

He began his association with The Linde Air Products Company in 1922 as Assistant General Sales Manager in Charge of Service. Four years later he became Consulting Engineer on Process Development, a position he held until his death. One of his early contacts with the field of welding and cutting was in connection with the cutting activities incident to raising the battleship Maine from Havana Harbor in 1908.

Mr. Doyle served as a director of the American Welding Society and was president of that organization in 1930-31. He was responsible for the organization of the Committee on Building Codes and was chairman of this committee until his election as president of the Society.

MARY SPEAR

Miss Mary Spear, a veteran of natural gas association service, died at her home in East Orange, N. J., April 28 at the age of 66.

Miss Spear was in charge of membership records for the American Gas Association until a short time before she retired, March 1, 1944. She completed more than 25 years' service with the association and the former Natural Gas Association of America.

Known to more old-time natural gas men than probably any other person, Miss Spear had not missed a natural gas convention in her first 20 years in the industry. She joined the Natural Gas Association of America in 1919 as librarian at its Pittsburgh headquarters. She became a part of the A.G.A. staff in 1927 at the time the Natural Gas Association merged with the A.G.A.

C. C. ABBOTT

Corwin Carleton Abbott, who was recently appointed Sales Manager of the Gas Products Division, Pittsburgh Equitable Meter Company, died suddenly in Cleveland, Ohio, May 8, while attending a committee meeting of the American Gas Association.

Mr. Abbott, who was 56, became connected with the Pittsburgh firm in 1936, and previous to his sales appointment had served as Acting Chief Engineer since 1941. He is credited with the development of many regulating and control devices that are widely used on direct war instruments.

Before coming to Pittsburgh he was an engineer for the Connelly Iron Sponge and Governor Company of Chicago.

Born in Saunemin, Illinois, Mr. Abbott was a graduate of Purdue University. He was a commissioned officer in the Field Artillery in World War I and an active member of the American Legion.

W. A. RUSSELL

After an allness of several months, W. A. Russell, Second Vice-President of the American Society of Heating and Ventilating Engineers, died May 12, at Kansas City, Mo.

At the time of his death, Mr. Russell was district manager for the Hoffman Specialty Co., with headquarters in Kansas City. He was a member of the fuel oil panel of the War Price and Rationing Board of Kansas City since its inception three years ago, and recently the ration board administrator praised Mr. Russell's activity and interest in the service.

FRED S. DEWEY

Fred S. Dewey, 64, general sales manager of the Cincinnati Gas & Electric Company, died suddenly on May 27, as the result of a heart attack suffered during a golf match.

Mr. Dewey was born in Murray, Iowa, and graduated from Iowa State University in 1903 with the degree of Bachelor of Science and Engineering.

Prior to coming to Cincinnati, he had been general manager of the Muscatine Light Company, and Vice President in charge of sales of the Kansas City Power & Light Company. He came to Cincinnati in 1928 to assume the position he held until his death.

Harry D. Wagner Added to Foxboro's Cleveland Staff

The Foxboro Company, Foxboro, Mass., announces the addition of Harry D. Wagner to its staff of engineers serving the Cleveland area. He has already taken up his new duties at the company's office, 417 Bulkley Bldg., 1501 Euclid Ave., Cleveland 15, Ohio. He has had extensive practical training in industrial instrumentation.

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Charts and Floor Plans of New Freedom Gas Kitchen

Wall charts and floor plans of the New Freedom Gas Kitchen, focal point of the gas industry's drive in its expanded national advertising and promotion campaign, are being distributed by the American Gas Association to teachers of home economics throughout the nation.

Features of the enlarged kitchen design being distributed during April and May to teachers for class room use are: perfect "U" plan design, close coordination of gas refrigerator, gas range and sink, plentiful use of glass. Decorative features include the use of a floor covering that carries from kitchen into a nearby breakfast nook, and is keyed to the color treatment of the kitchen.

Bryant Heater Company Announces Appointments

R. C. Gregg has joined the engineering staff of the Bryant Heater Company, Cleveland, Ohio, it is announced by Mr. Lyle C. Harvey, president.

Formerly assistant chief research engineer of the American Gas Association Testing Laboratories, Mr. Gregg is a native of Tiffin, Ohio, and a graduate of Ohio Wesleyan University. His broad experience in testing and research work has included service as technical advisor to various approval requirement committees in the past several years. Mr. Gregg will be engaged in fundamental research work for the Bryant Heater Company, leading to new product development in the gas heating field.

N. Charlton Gilbert has been appointed Industrial Relations Director. Prior to his new connection with the Bryant Heater Company organization, Mr. Gilbert was personnel director for the A. C. Gilbert Co., New Haven, Conn.

Cutting Refractories

Colorful and informative is the 32-page handy bulletin describing masonry saws issued by Clipper Manufacturing Co., St. Louis, 10, Missouri.

It describes their application which leads to economy in refractory construction. The cutting principle is based on using a series of rapid, shallow cuts in the brick or shape which rests on a conveyor cart moved back and forth beneath the saw. Angle, bevel and intricate cuts are accurately made.

A knock-down frame model is also available which can be carried in the rear of a motor car.

"Lincolnweld"

A 28-page bulletin, No. 439, issued by Lincoln Electric Company, Cleveland 1, Ohio, describes in considerable detail with ample illustrations their automatic shielded arc welding process.

In this process, granular flux in sufficient depth to cover the completed weld is deposited on the joint prior to welding. A bare metallic welding electrode is powerfed through the blanket of flux under automatic control.

Direct current from a Lincoln welder creates an arc between electrode and joint, fusing electrode and metal to produce the weld. The blanket of flux protects the weld metal from contact with the air and makes possible the use of high amperage for fast welding.

The advantages of the system are shown in detail. Procedures are shown by diagrams and tables and typical installations are illustrated. Welding units and accessories are also described. The bulletin is available on request.

A. O. Smith Corporation Elects L. B. Smith V.P.

Lloyd B. Smith, son of the late L. R. Smith, for many years chairman of the board of the A. O. Smith Corporation, was elected vice-president and member of the board at a directors meeting in Milwaukee on May 1.

Morris J. Vollmer, former assitant to the president, was named assistant secretary and assistant treasurer, and A. von Wening, vice-president and controller, was elected to the board.

W. L. Hutcheson and J. E. Coleman Promoted

W. L. Hutcheson has been advanced to sales manager and James E. Coleman has been appointed assistant sales manager of the Pittsburgh Group of natural gas companies of the Columbia Gas & Electric Corp. These personnel changes were announced on June 1, by C. E. Bennett, president of the Manufacturers Light & Heat Co., Cumberland & Allegheny Gas Co., Gettysburg Gas Corp. and the Natural Gas Company of West Virginia.

Mr. Hutcheson and Mr. Coleman will maintain headquarters in Pittsburgh.

Water Heating

(Continued from page 32)

bill complaints or complaints of insufficient hot water during either summer or winter operation have been entirely nil during the past few years.

"I do not hesitate to say that after the present emergency the bulk of our house heating sales will consist of this type of equipment."

Mr. T. J. Perry, Superintendent of the Customers' Service Division of The Brooklyn Union Gas Company states:

"House and water heating services combined in a single appliance offer several advantages to the service department which are of sufficient importance to make those of us who have had experience with this type of appliance hopeful that the future will increase the number of them attached to our lines.

"It is well known that an appliance in year-round service is less susceptible to effects of corrosion and periodic cleaning than an appliance which is used seasonally. The slowing up of the corrosion rate is helpful to the service department and instrumental in prolonging the life of the appliance to the customers' advantage.

"The characteristics of an individual house heater and an individual water heater results in a certain number of service calls per year.

"One might think that combining the two appliances would produce about the same number of mechanical failures with resulting visits of the serviceman. Such, however, is not the case and we attribute this largely to the fact that one set of controls is used where two sets served before."

Mr. Kenneth Worth, manager of the Customers' Service Division of our Commercial Department says:

"Our experiences with coil heaters in regard to high bill complaints has been most satisfactory and quite surprising. Complaints on this equipment are rare and substantially lower in proportion to the number of such appliances in use than any other type of heater."

Mr. Edward J. Gerridge, Supervisor of the House Heating Division in our New Business Department states:

"I have currently checked with the District Supervisors with regard to customer satisfaction with year-round domestic hot water from central plants.

"They have confirmed my own high opinion of this method. Nothing has occurred which would lead me to change my belief that this feature will be a sales strong-point when restrictions on gas heating are lifted.

"Service and High Bill men lend further strength to this opinion as they feel that, if anything, less trouble is encountered than with separate units.

"Circumstances in the individual home and local water conditions will prevent this type unit from taking over the field completely, but it will hold a dominant position in our territory.

"Sales advantages to us are numerous, but the outstanding advantage in our territory is that it meets an actual customer demand, eliminating the previous unselling required when the separate unit was a 'must'."

Mr. Edward A. Koster, Supervisor of the Apartment House and New Development Division of the New Business Department, says:

"From a sales angle, this type of equipment has proved to be of tremendous help to us in securing house heating sales. From the builder's standpoint, the lower costs plus the simplicity of installation, are definitely desirable. However, it is from the ultimate consumer's angle that the equipment has really shown its worth. Even during the original experimental period, we encountered no major complaints and today we receive only a few minor ones. The operating cost has proved to be reasonable and the job of selling this operating cost to new purchasers has not been difficult at all.

"As to the adequacy of the equipment to deliver the hot water required, we have received no complaints which could not be easily answered by a very simple demonstration of the way in which the equipment was designed to work. We know of a considerable number of 'doubling up' of families, but even in these cases, the supply is apparently adequate.

"In our post-war planning, we contemplate a much wider use of this type of equipment because of its obvious benefits to us, the builder and the consumer."

Presented at the meeting of Metropolitan Gas Heating and Air Conditioning Council, New York, May 16th, 1945.

Test Procedure

(Continued from page 47)

The excess sodium chloride is back titrated with silver nitrate solution, using a saturated solution of sodium chromate as an indicator. The end point is detected as the first permanent orange color obtained.

Calculations for the mercaptans are carried out as follows:

$$G = \frac{(S)\ \ (1.3146)}{V}$$

Where:

G = Grains of mercaptan per 100 cu. ft. of gas
S = Silver nitrate used in titrating, cc.
V = Corrected gas volume, cu. ft. (60°F. & 14.7 #/sq. in.).

The factor for the mercaptan is twice that of hydrogen sulfide because mercaptans contain only one replaceable hydrogen as compared with two for hydrogen sulfide. The values for H_2S and R-SH are combined in determining the status of the well.

Transmission Rates

(Continued from page 46)

including that sold for resale direct to the industrial consumers, is subject to rate regulation by the Commission. Section 1 (b) of the Natural Gas Act does not prescribe consideration of the production and gathering properties of the producing company in determining the rate base. An order of the Commission is not invalid on the ground that the production properties were included in the rate base at the original cost; nor because of the use of the original cost of the leasehold rather than the price of its transfer between subsidiaries of the producing company.

Third Case

In the third case, Colorado-Wyoming Gas Co. v. Federal Power Commission, Colorado Interstate Gas Co., City and County of Denver et al., the Supreme Court affirms the Tenth Circuit's judgment insofar as it sustained the Commission's order directing the company to reduce its rates by $98,000. As to the balance of the rate reduction, the judgment was reversed, the Commission's order set aside, and the case remanded for further proceedings before the Commission for further findings of fact as to the portion of the rate reduction which appeared to be "shrouded in doubt."

The majority opinion held that the Commission properly applied the method of allocation of costs including in the regulated business wholesale intrastate sales of gas obtained from the intrastate transmission line connected with the interstate pipe line of the supplier. Chief Justice Stone and Justices Roberts, Reed and Frankfurter were of opinion that the case should be remanded to the Commission for separate allocation of investment and operating cost between the regulable and non-regulable properties, as well as for clarification of findings directed.

National Radiator Co. Appoints P. M. Hutchins

Appointment of P. M. Hutchins as manager of advertising and sales promotion for The National Radiator Company, Johnstown, Pa., has been announced by President R. S. Waters.

Formerly advertising director of three daily newspapers in Georgia, Mr. Hutchins had been associated from 1932 to 1944 with the Pittsburgh Sun-Telegraph, in recent years as general promotion manager.

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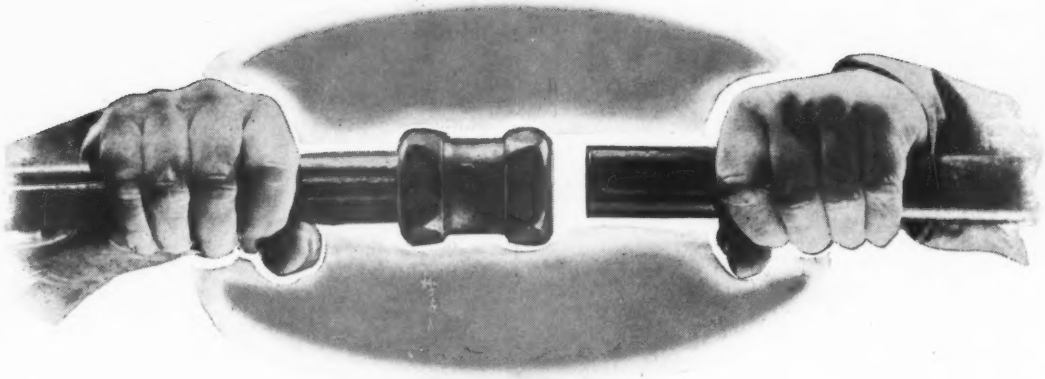
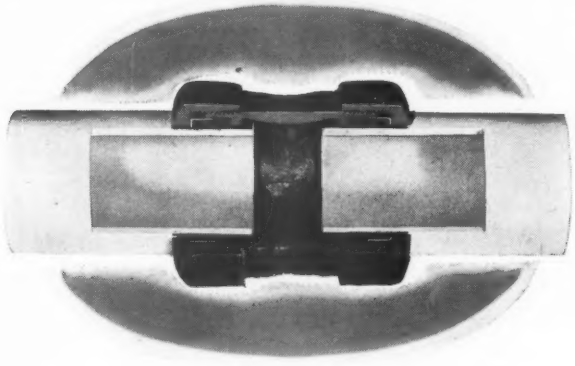


No accurate pipe fitting necessary



when joined with "Dressers"

With Dresser Boltless Fittings, accurate pipe cutting and alignment are unnecessary. What's more, no threading is required for a joint that will stay tight under usual or severe operating conditions. Just stab the fitting over one pipe end . . . slip pipe into other end of fitting . . . and tighten the end-nuts with a wrench, to compress the resilient gaskets and make a flexible, leakproof seal.

These convenient fittings are available in sizes 3/8" through 2" ID, and in all standard types. They permit extraordinary speed and convenience in the joining of small piping . . . and fully meet service requirements. Send us your inquiry.

★ ★ ★

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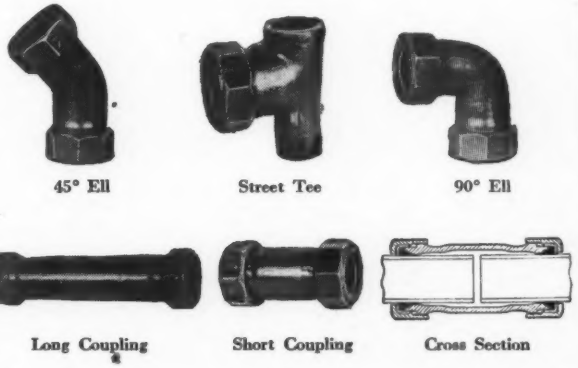


DRESSER FITTINGS for Small Piping

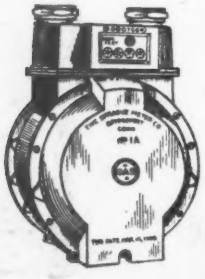
Watch for New Developments from Sprague

A great many improvements in all fields of endeavor will evolve from scientific advancements made in this war.

New chemicals, new metals, better plastics, synthetics and electronics will find application in civilian goods. It staggers the imagination to visualize what the future may hold.

In any event, you can be assured that SPRAGUE will continue to be in the forefront as it has been for the past forty years.

CARNEGIE LIBRARY
JUN 15 1945
OF PITTSBURGH



THE SPRAGUE METER COMPANY